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THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE

EDITED BY

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VOLUME LXII.

[THIRD SERIES.—VOL. XII.]

'J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.'—*Laboulbène*.

LONDON :

NATHANIEL LLOYD & CO., LTD.,
BURRELL STREET WORKS, BLACKFRIARS, S.E.1.

1926

ERRATA.

[In addition to those noticed on p. 183.]

Page	30,	line	11	from	bottom,	for	' <i>C. internana</i> '	read	' <i>G. internana</i> .'
"	38	"	16	"	top	"	' <i>Cotocala</i> '	read	' <i>Catocala</i> .'
"	40	"	5	"	bottom	"	' <i>Cawthorn</i> '	read	' <i>Cawthron</i> .'
"	42	"	7	"	"	"	' <i>Entomological</i> '	read	' <i>Entomologicae</i> .'
"	44	"	26	"	top	"	' <i>uuch</i> '	read	' <i>much</i> .'
"	48	"	9	"	"	"	' <i>Brown</i> '	read	' <i>Browne</i> .'
"	48	"	16	"	"	"	' <i>Musford</i> '	read	' <i>Mumford</i> .'
"	48	"	4	"	bottom	"	' <i>ichneumonoides</i> '	read	' <i>ichneumonides</i> .'
"	48,	bottom	line,	for	' <i>Stol</i> '	read	' <i>Stål</i> .'		
"	59,	line	10	from	bottom,	for	' <i>Pseudoccus</i> '	read	' <i>Pseudococcus</i> .'
"	62,	bottom	line,	for	' <i>Presina</i> '	read	' <i>Plesina</i> .'		
"	76,	line	8	from	top,	for	' <i>tibrae</i> '	read	' <i>tibiae</i> .'
"	113	"	11	"	"	"	' <i>were</i> '	read	' <i>was</i> .'
"	113	"	5	"	bottom	"	' <i>Rhythus</i> '	read	' <i>Rhyphus</i> .'
"	139	"	19	"	top	"	' <i>Saarsbrücken</i> '	read	' <i>Saarbrücken</i> .'
"	207	"	17	"	"	"	' <i>obcuritarsis</i> '	read	' <i>obscuritarsis</i> .'
"	270	"	11	"	bottom	"	' <i>splended</i> '	read	' <i>splendid</i> .'
"	270	"	2	"	"	"	' <i>H. W. Bates</i> '	read	' <i>G. Lewis</i> .'
"	270,	bottom	line,	after	' <i>with a map</i> ,'	insert	' <i>H. W. Bates</i> .'		

On p. 197, line 19 from top, the synonym *Telephorus brahminicus* Gorh. is incorrectly placed under *Athemus rubricollis* Hope: it should be given under *A. trimaculatus* Hope, var. 2, on p. 198, between lines 8 and 9 from bottom.

THE
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VOLUME LXII.

[THIRD SERIES, VOLUME XII.]

ODONATA OBSERVED IN FRANCE IN 1923 AND 1924.

BY KENNETH J. MORTON, F.E.S.

To say that our knowledge of the dragon-flies of France is imperfect is but another way of emphasising the great extent and varied character of that country, and the relatively small number of observers. McLachlan's words in the geographical summary at the end of his 'Monographic Revision and Synopsis of the *Trichoptera* of the European Fauna' might be applied almost equally well to the Odonata. He said: 'There is probably no other (European) country so completely combining all the conditions favourable for *Trichoptera*. The ordinary requisites are all present, and in addition there are vast mountain ranges in Savoy and Dauphiné suitable to the production of all species possessed by Switzerland, and, what is still more important, the chain of the Pyrenees and the old volcanic regions of Central France, in which we have great altitude without the deterrent effects of the vicinity of glaciers. Finally Provence (with the Alpes Maritimes) possesses the true Mediterranean element.' Perhaps to this should be added a separate Lusitanian element represented in *Trichoptera* by the genus *Calamoceras* and by such Odonata as *Macromia splendens*, *Oxygastra curtisi* and *Gomphus graslini*.

Much of this vast area may be regarded as practically unexplored as far as dragon-flies are concerned, and although in such a restricted order few actual additions to the French list can be expected, no doubt many interesting facts connected with their distribution remain to be brought to light. It seems very desirable therefore to put on record the results of collecting in any parts of the country where little work on the order has been done.

With my wife and family I spent August and September of last year at Cagnes, in the Alpes Maritimes, a wonderful old place more beloved by artists than by entomologists. One writer said that all he could find out about it before he went there was that it was the station for the Nice golf links! He left it with quite different ideas, and Sir Frederick Treves and others have written appreciations. The old portion of the town is built on a hill (from which the early rising enthusiast may view the scented isle—Corsica—just before sunrise), and, as we lived near the top, getting home after several hours collecting in the hot sunshine was no mean addition to the day's work. But to return to our subject. We suffered from two drawbacks, one being the already advanced season, some of the early species having no doubt disappeared. The other is common to dry southern countries in which during their long summer many standing waters and small streams completely dry up. Our principal hunting grounds were near the Cagnes River and the River Loup. The latter usually carried a good volume of beautifully clear water, notwithstanding the demands for irrigation, while the smaller Cagnes River was liable to greater fluctuation, and at times its course, when it neared the beach, was a mere succession of large pools. On account of its smaller size, it also showed more the effects of the presence of the industrious washerwoman who was more or less a permanent resident on its banks. A minor stream connected with the Cagnes also carried running water in the upper part of its course, while several of the larger irrigation channels seemed to carry water perennially and were frequented by several species of dragon-flies. The rivers were, however, rather difficult to work, the Cagnes river especially so, on account of the dense cane-brakes (*Arundo donax*) and often impenetrable growth of brambles and other bushes which clothed its banks. A lake of considerable size is shown on the map at Vaugrenier on the Antibes road, but I failed on a passing visit to see any open water; this, however, may have been hidden by the luxuriant growth of reeds and other aquatic vegetation. Ditches which I was able to examine were nearly dried up, but that they carried water during a great part of the year was evident from the myriads of *Lestes* by which they were occupied.

In the annotated list which follows I have included the dragon-flies which were observed in the Pyrenees and Central France, visited in the summers of 1923 and 1924 respectively, in company with my friend, Mr. Martin E. Mosely. An account of the entomo-

logical results of these excursions, especially in Trichoptera, will, I hope, appear later. Our itinerary was as follows. In 1923, leaving London on 15th June, we intended to make a short break at Montauban; but as the rain, which had been falling at Paris in the evening, had waxed overnight into a storm and continued in the early morning, we decided to go on to Carcassonne, where we hoped to find the more settled conditions of the Midi, and were not disappointed. We remained at Carcassonne till 18th June, thence proceeding to Quillan (from there spending a day at Axat) in the Valley of the Aude. We reached Mont Louis, Pyr. Orientales, on 23rd June and remained till 1st July, afterwards returning home by way of Bourg Madame (no collecting), Ax les Thermes (3rd) and Foix, Ariège (4th-5th), finishing at Cahors in the Dept. of Lot (7th).

In 1924 we began at Cahors on 29th June, afterwards visiting Figeac 1-2 July), le Monastier, Lozère (3rd), Mende, Lozère, with day excursions to Ispagnac and Serverette (3-8 July), thence to le Lioran, Cantal, with day excursions to Vic and Murat. Mr. Mosely left le Lioran for London on 19th, while I remained till 28th, going on to Avignon on 29th to meet my people. No collecting was done during visits to Nîmes, Tarascon, Arles and the Pont du Gard, in which region I had collected in 1911 (Entomologist, XLV, pp. 109-112) and 1914.

CALOPTERYGINAE.

Calopteryx splendens Harris.—Carcassonne, Cahors and Figeac. All the examples belong to the southern race *xanthostoma* Charp.

C. virgo Linné.—Carcassonne (teneral), Axat, Foix; Figeac, Mende, between Mende and Serverette, Ispagnac, Vic and Murat. Two females from the last-named place very dark, one decidedly approaching the coloration of the male. All var. *meridionalis* Selys.

C. haemorrhoidalis Vanderl.—This beautiful species was very abundant during August at all the streams and larger irrigation channels near Cagnes. It lasted well into September, becoming scarcer after the middle of the month.

LESTINAE.

Lestes viridis Vanderl.—Very common at the Cagnes River and minor water-courses in the neighbourhood, even where these were for the time being quite dry. Throughout August and September; were pairing freely on 5th September.

L. dryas Kirby.—Was emerging in vast numbers from a marsh in the neighbourhood of Mont Louis on 30th June. The Mont Louis localities mentioned in this paper are all well over 5,000 ft.

L. virens Charp.—A few between Mende and Ispagnac. Common at Vaugrenier between Cagnes and Antibes, 21st August.

L. barbarus Fabr.—Vaugrenier with the last but in extraordinary numbers. A few females near the mouth of the Cagnes River in September; no males observed there.

Sympecma fusca Vanderl.—Mende and neighbourhood rather common. A few seen at Le Lioran (over 4,000 ft.) may have strayed from lower down the valley.

AGRIONINAE.

Platynemesis acutipennis Selys.—Common at Carcassonne, Cahors and Figeac.

P. pennipes Pallas.—A single ♂ at Cahors at end of June was interesting, as it confirmed the existence of the three species of the genus together at the River Lot.

P. latipes Ramb.—Carcassonne and Cahors. At Cagnes it was fairly common during August and was noted right up to the end of September; it occurred along with *C. haemorrhoidalis* at all the running waters.

Ischnura elegans Vanderl.—Carcassonne and Foix. A few near the mouth of the Cagnes River; more numerous at the River Brague nearer Antibes.

Enallagma cyathigerum Charp.—Mont Louis.

Agrion puella Vanderl.—Between Mende and Serverette; Murat.

A. hastulatum Charp.—Abundant at some permanent ponds near Mont Louis. As far as I know this species has not been previously recorded from the Pyrenees.

A. mercuriale Charp.—A few at a little stream which passed under the Canal a short distance from Carcassonne.

A. lindeni Selys.—Common at Carcassonne and Cahors.

Pyrrhosoma nymphula Sulzer.—Quillan, the only dragon-fly taken there; it occurred at a small stream with *Osmylus*. Also at Mont Louis; between Mende and Ispagnac, between Mende and Serverette and at Vic-sur-Cère.

P. tenellum de Villers.—At Carcassonne, along with *A. mercuriale*; and commonly at a small side stream joining the river Brague near the Antibes road.

GOMPHINAE.

Gomphus vulgatissimus L.—One ♂ at Cahors 29-30, vi, 24; not seen there in 1923; single males at Mende and Le Monastier.

G. simillimus Selys.—Both sexes occurred at Carcassonne 16-18, vi, '23, on a sandy flat piece of ground covered with rough herbage near the river Aude; also near the river at Figeac 1-2, vii, '24.

G. graslini Ramb.—Common at Cahors on the banks of the Lot on 7, vii, '23, the males adult, females teneral, but we had little time to devote to the species, which was apparently absent on our second visit at the end of June, 1924.

G. pulchellus Selys.—Carcassonne, a few along with *G. simillimus* as above.

Onychogomphus forcipatus L.—Cahors (1923-1924); Figeac; Mende; between Mende and Serverette; Vic-sur-Cère. The southern race *unguiculatus* occurred sparingly at the Cagnes river and River Loup during August; the only female taken was seen in the early morning flying along the Vence road, on which it settled and was captured by hand.

Onychogomphus uncatus Charp.—Carcassonne ♀ (teneral); Figeac (2 ♂♂, adult).

Ophiogomphus cecilia Fourcr.—I did not meet with this species myself, but my son captured a fine ♀ at Mer on the Loire, 29, viii, '23.

CORDULEGASTERINAE.

Cordulegaster annulatus Lat.—Very common at a small, clear stream running through meadows between Mende and Serverette, where *C. virgo* was also abundant. Not seen with certainty elsewhere, but exuviae found at Quillan and Mont Louis probably belonged to this species. The var. *immaculifrons* Selys did not occur.

AESCHNINAE.

Aeschna juncea L.—Mont Louis, ♀. At le Lioran this species was common. It was constantly in evidence, flying along the paths in the woods and hawking insects in the opener spaces. But no breeding grounds for such dragon-flies could be found near le Lioran, and I suspect that not only *juncea*, but *mixta*, which occurred along with it more sparingly, and *Sympetrum striolatum* were visitors from the lower parts of the valley. These species, and *Anax imperator*, too, seem to resort to higher and cooler levels when they are teneral and adolescent, there to sun themselves, feed and become mature, later returning to their breeding

grounds. The late Mr. Rowland Brown, who visited le Lioran in August, 1909 (Entomologist, Vol. 42, p. 301), refers to flights of *Anax imperator*, which he seemed disposed to blame in part for his want of luck and to regard as destroyers of butterflies. I can only say that I saw no *Anax*, but plenty of *Aeschna juncea*, that no case of the latter attacking butterflies came under my notice, and that the beginning of August seems to be too late to see the butterflies of le Lioran at their best.

A. mixta Latr.—A few seen at le Lioran. At Cagnes during August it might be seen hawking insects along shaded parts of roads. One road running through a pinewood on the ridge of a hill was frequented not only by *A. mixta* and *Anax imperator* but also *Charaxes jasius*. About the middle of September many *mixta* began to appear at the pools near the mouth of the Cagnes river and were easily captured there, coupled pairs being frequently seen. On the forenoon of the 24th dragon-flies seemed to be more plentiful than usual. It was very close and warm, and in the afternoon there was a violent thunderstorm. Next morning it was decidedly cool, and the entire *mixta* population seemed to have gathered together and were flying wildly about over a rough piece of ground near the beach, sheltered from the wind by an extensive cane-brake. A few *Anax* were included in the throng.

A. affinis Vanderl.—A single mature ♂ was taken at Cagnes, 20th September, hovering over a meadow.

A. cyanea Müller.—Cagnes: scarce and shy. Immature examples found once or twice in August, flying along shaded wood-paths. A few mature specimens taken in August skirting the margins of streams, mostly in shade.

Anax imperator Leach.—Fairly common 29-30 June, '24, at Cahors; a good many, presumably of this species, seen on 7th July of the previous year, but not taken. *Anax*, no doubt this species (but perhaps at such an altitude only visitors), was seen once or twice at ponds near Mont Louis; the insects were quite unapproachable there. Very common at Cagnes. More or less immature examples, as I take it, were frequently seen flying high over woods or along roads and wood-paths, but were difficult to catch in these circumstances. Mature males patrolled the rivers, and one could watch them any day from the bridge over the Cagnes river on the Nice road. At the pools near the beach the insect was easily captured, and I obtained as many as I wanted there of both sexes. Broken pieces of *Arundo donax* and perhaps also of *Typha* float in these pools, and the females, as far as I

could observe, appeared to make use of the blades of these plants for oviposition. The species remained in good condition till the end of September.

A. parthenope Selys.—A worn pair at the Canal, Carcassonne, 16th June, '23. Not seen with certainty elsewhere.

Hemianax ephippiger Burm.—One of the most interesting species observed on the Riviera. For a period of three weeks or so from about the middle of August it was common around Cagnes; they flew high and usually rather wildly over roads, woods, dry hill-sides and vineyards, mostly in twos, and were generally quite unapproachable. A little group of four was noticed over a garden on the Vence road; they strayed occasionally over the road, and I succeeded in reducing their number by one. My total captures were six females and one male, all won by much waiting. It was clearly a case for the .22 Winchester rifle and dust shot, a mode of hunting successfully followed by Perkins in Hawaii against *Anax strenuus*, and against other big species by the Williamsons and Kennedy in America and by Fraser in India. The first example was taken on 17th August, the last on 7th September; very few were seen after the latter date. On 25th August we motored from Cagnes to San Remo, and the insect was noticed at several points on the way, especially near the frontier, and I think its range extended into Italy. How far beyond Cagnes to the westward it occurred I do not know. None of the examples secured were quite fully coloured. The status of the species in Europe has been regarded as that of an immigrant, but better proof of this is required as regards the Mediterranean countries. Where the Cagnes specimens came from and whither they went remains a mystery, I am tempted to believe that they had origin nearer than Africa. [Since this was written I have seen a ♀ taken near Bayonne on 17th June, 1925, by a young collector, Mr. John Smart, Edinburgh.]

Boyeria irene Fonscol.—Cagnes, 6-15 September, five ♂♂, all very mature. Probably I had previously overlooked it through ignorance of its habits. Two were taken near the Cagnes river by a road-side, which was rocky, abrupt and wooded; the others flew low along the verge of the water, and in both cases they searched closely every nook and corner in their course, always preferring to keep in the shade. Those found by the road-side especially had a most peculiar buzzing and somewhat gyrating flight, and were probably looking for females rather than food. Kellicott wrote of the American *B. vinosa*: 'It prefers seclusion, hence should be looked for along ponds and streams with well-wooded banks,

where branches overhang the water, and where half-submerged logs and rubbish abound. The males may be seen from early in the forenoon till dark on warm days, exploring every corner among the obstructions at the water's edge. . . . The females, when not ovipositing, are suspended from some overhanging twig.' M. Lacroix, who finds *B. irene* commonly at Niort, Deux Sèvres, says that in the fine season, when the days are long, it flies very late, even up to 9.30, and that it is given to entering houses. At Cagnes and elsewhere in France I observed many Aeschnines flying just at dark, both over rivers and vineyards and gardens, also low over roads; but I was unable to identify any of them with certainty.

CORDULIINAE.

Somatochlora metallica Vanderl.—One ♂ at a small stream running through a boggy tract between Mende and Serverette.

Cordulia aenea Linné.—Two teneral males in pine woods above the Etang noir, near les Bouillouses, Pyrénées Orientales, 27, vi, altitude probably about 6,000 ft. It is impossible to say whether several other Corduliines seen at the same place, but all flying high, were all of the same species.

Oxygastra curtisi Dale.—One or two newly emerged males at the Canal, Carcassonne. Very common at Cahors on both occasions, flying leisurely along the margin of the river Lot.

Macromia splendens Pictet.—Cahors (see Ent. Mo. Mag., Vol. LXI, pp. 1-5, 1925).

LIBELLULINAE.

Orthetrum caerulescens F.—Cagnes: about the rivers and irrigation canals fairly common.

O. brunneum Fonscol.—Very common, frequenting the paths leading through meadows and vineyards near the rivers. Probably bred in the irrigation channels as well as in the pools near the mouth of the Cagnes river.

O. cancellatum Linné.—Cagnes: only moderately common and chiefly at the last mentioned pools.

Crocothemis erythraea Brullé.—Common at the same pools during August and September.

Libellula depressa Linné.—Vic and between Mende and Serverette. Single specimens also believed to have been seen at Cagnes and near Mont Louis.

L. quadrimaculata Linné.—Locally very common at Mont Louis.

Sympetrum striolatum Charp.—Frequent at le Lioran (sub-juv.); very common at Cagnes.

S. fonscolombei Selys.—At ponds near Mont Louis this species was numerous; as many as three or four pairs might be seen ovipositing in a space of not more than two or three square yards. It would be interesting to know the fate of the eggs, as the winter must be rigorous at such an altitude. The life cycle of the species seems to be quite unknown. At Cagnes odd examples were seen on dry hillsides, but its favourite haunts were about the lower parts of the Cagnes river, where it was common.

S. meridionale Selys.—Like the last, occurring sporadically on dry hillsides and waste places; later, mature fully coloured specimens at the Cagnes river, but comparatively few altogether.

S. depressiusculum Selys.—The commonest Libelluline at Cagnes throughout August and September. Especially abundant in vineyards, gardens and meadows near the Cagnes river, apparently breeding in the irrigation ditches as well as the river. A pretty little insect in life and quite unmistakable, with red body and rather delicate wings, which have a golden shimmer.

Leucorrhinia dubia Vanderl.—Rather common at ponds and marshes not far from the road from Mont Louis to les Bouillouses.

13 Blackford Road,
Edinburgh.

November 1925.

BEMBIDION REDTENBACHERI K.DANIEL, A COLEOPTERON
NEW TO BRITAIN.

BY NORMAN H. JOY, F.E.S.

I captured four examples of this species about three miles from Sheffield on October 27th, 1925, by the side of a small brook. In Fowler's table it should come next to *prasinum* Duft., differing from the latter in its more convex shape, the elytra being more rounded at the sides, and in having the striae punctured; the aedeagus, too, is dissimilar in structure. Three of my specimens are black and one has a slight metallic lustre, but Continental examples are rather strongly metallic.

I took at the same time two specimens of *B. bruxellense* Wesm., which had only a trace of yellow on the elytra. *B. redtenbacheri* is a common alpine insect on the Continent. I have to thank Mr. Champion for naming this species and Mr. H. E. Andrewes for confirming it.

Reading.

December 6th, 1925.

A NEW BROMELIADICOLOUS PTILIID [TRICHOPTERYGID]
BEETLE FROM TRINIDAD.

BY H. BRITTEN.

The new species of the genus *Acrotrichis* Motsch. [*Trichopteryx* Auctt.*], described below, was taken in Bromeliaceous plants in Trinidad. It is probable that other interesting genera and species of these minute beetles would reward a careful search in similar habitats elsewhere.

Acrotrichis ochracea, n. sp.

Trichopteryx sp., Scott, Ann. Mag. Nat. Hist. (8) x, pp. 428, 429, 1912; Picado, Bull. Sci. France et Belgique, (7) xlvii, p. 349, 1913.

Ovate, moderately convex, slightly depressed in centre, with moderate pubescence; head ochraceous, shining, eyes black and appearing very distinct owing to contrast in colour; antennae moderately long, yellow at base, gradually darkening to apex; thorax broadest at base, evenly rounded, angles strongly produced into a blunt point, ochraceous, very finely asperate and reticulate in centre, more strongly so at sides; elytra longer than head and thorax, strongly asperate and reticulate, apices almost square, ochraceous, the wings showing as dark patches; legs testaceous; underside entirely ochraceous.

Length 0.82 mm.

The colour, together with the depressed centre of the thorax and elytra, quite readily distinguishes this species.

TRINIDAD: summit of Mt. Tucuche, 3,100 ft., 20, iii, 1912; two specimens from between bases of leaves of Bromeliaceae (*Tillandsia* sp.), taken by Hugh Scott. Two other specimens obtained at the same time were preserved in alcohol but afterwards lost.

TYPE in British Museum; paratype in Cambridge Museum.

Manchester Museum,

October 23rd, 1925.

[This insect was mentioned by me as '*Trichopteryx* sp.' in my 'Contribution to the Knowledge of the Fauna of Bromeliaceae,' published in 1912, as cited above. In the same paper, p. 430, it was also stated that specimens of a *Trichopteryx* were seen in a similar habitat in another West Indian island, namely Dominica, but unfortunately no examples were permanently preserved. The Trinidad record is quoted, also under the name '*Trichopteryx* sp.,' by Picado in his long work on the fauna of Bromeliaceae as a whole, 'Les Broméliacées Epiphytes considérées comme Milieu Biologique,' also cited above. As is well known, the spaces between the bases of the leaves of epiphytic Bromeliads contain water and humus, and are the home of an extensive and specialised fauna, including representatives of many classes of animals, not

* For the name of the genus, Csiki, Coleopt. Cat. Part 32, 1911, is here followed.

only insects. But the long list of this fauna given by Picado includes no other representative of the family PTILIIDÆ besides the one at present under review, and I am not aware that any other has since been recorded. There are, however, later records of Bromelia-haunting insects of other kinds, notably in the work of Dr. L. G. Saunders 'On the Life-history, Morphology and Systematic Position of *Apelma* Kieff. and *Thyridomyia* n.g.' (Parasitology xvii, pp. 252-277, 1925); this article contains a photograph of terrestrial Bromeliads of the genus *Aechmea*, in which the early stages of some species of *Apelma* were found near Rio de Janeiro, and also (p. 253) some records of bromeliadiculous insects of other Orders, while further such records can be read in a forthcoming paper by Mr. G. L. R. Hancock on 'A Winter Entomological Visit to Central Brazil,' which will appear in the 'Entomologist' for 1926.—HUGH SCOTT.]

ON THE LUMINOSITY OF PYROPHORUS (COLEOPTERA).

BY K. G. BLAIR, B.SC., F.E.S.

Though the use of the light in many genera of Lampyrid beetles has been studied in some detail, and its value in securing the mating of the two sexes amply demonstrated, but few observations on the bionomic functions of the light in the Elaterid-genus *Pyrophorus* appear to have been made.

The light-organs in these insects, instead of being situated beneath the posterior segments of the abdomen as in the family Lampyridae, form two groups, viz. a pair on the dorsal surface of the prothorax, one near each of the posterior angles, and a median ventral light situated at the base of the abdomen, concealed when the insect has the wings folded by the membrane through which it is displayed abutting against the posterior edge of the metasternum. It is only when the abdomen is distended or raised that the gap between the opaque sclerites of metasternum and abdomen allows this light to be visible. Mr. Champion long ago pointed out that the size of the ventral luminous organ varies considerably in different species, in some occupying almost the whole width of the membranous region, in others being reduced to a very narrow space [Biol. Centr.-Amer., Coleopt. III, 1, 1896, p. 464, pl. 20, figg. 19a, 21a, 31b, 32a]. The lights are not constantly shining, but appear to be to some extent under the control of the insect and only to shine under the stimulus of excitement. There is some evidence for believing that both dorsal and ventral lights

react simultaneously to such a stimulus, though, owing to the ventral light being frequently concealed, it is difficult to ascertain this precisely. When the insect is creeping about the dorsal lights only are visible, but in flight the abdomen is raised and the ventral light is exhibited, and can be shut off or exposed by the alternate lowering and raising of the abdomen.

That the light served some purpose in mating was presumed on the analogy of the Lampyridae, but exact observations seemed to be lacking. At my request two separate correspondents have sent me many specimens of *Pyrophorus plagiophthalmus* Germ., the common species in Jamaica, forty or fifty in all, all of which proved to be males, thus suggesting that the females have very different habits and probably, not being attracted by light, do not fly around the houses.

More recently my friend Dr. C. L. Withycombe has been sending me beetles of this genus from Trinidad, and at my request has made accurate observations of their behaviour, and from his notes the following particulars are taken.

Two species of the genus are referred to by him, viz. *P. pellucens* Eschsch. and *P. extinctus* Illig.

P. pellucens, also known locally as the 'automobile bug' on account of the paired anterior 'headlights' on the thorax, was first observed on 10th April, after rain, and was still to be seen in mid-July, but not later. The insects sit among the herbage or on trees with the pale green 'headlights' almost continuously on, rarely fading, whereas the yellow ventral light only becomes visible as the insect spreads its wings to fly. It usually remains visible throughout flight, but is 'switched off' very shortly after coming to rest. Otherwise this ventral light is never seen except when the insect is placed on its back, when, as it bends back the thorax ready for springing, the abdomen is extended a little, allowing the light to become visible in the cleft between it and the thorax. Dr. Withycombe questions whether the light is not permanently on at night, but from observations on living specimens that he sent this is certainly not the case while the insect remains sluggish, and the light can be observed to kindle as it awakes to activity. When the insect prepares for flight it stretches out the abdomen several times, much as other insects do when about to fly, this action seeming to be a pumping operation for the purpose of filling the tracheae in order to have the increased supply of air requisite for the extra exertion expended in flight. On dissecting a strongly luminous female the tissues in the region of the ventral light were

found to be well supplied with tracheae, some of which were of greater breadth than those of the abdomen. Differences in the pigmentation of some of the tracheae were noted.

Certain differences in the behaviour of the sexes were noted. The males generally fly with the ventral light occasionally flashing, and come in numbers to light in the house, or to the headlights of a motor car in the 'bush.' The females, on the other hand, keep the ventral light on more continuously in flight, and both lights are brighter than those of the males. They usually fly only for short distances, and near the ground, so that their ventral light is not easily visible unless one is near to them, when the light shining on the ground shows up the track of the insect. The headlights are then usually, but not always, faintly on, and on alighting are again flashed up brightly. This behaviour is not constant, the males sometimes being observed with ventral light continuous, while that of the female sometimes slowly flashes, such flashes being no doubt caused by the depression or raising of the abdomen concealing or exhibiting the light. The females, particularly just after rain, may be found on decaying logs, often several together, when they are probably engaged in ovipositing. In such circumstances the headlights are usually full on, but no ventral light is visible.

Only once was a male seen following a female. Both flew rapidly in a straight line (an unusual thing for *Pyrophorus*, which usually flies somewhat erratically and not rapidly), the male about a yard behind the female. Both went down into the grass, the male keeping his lights on, though not brilliantly, the female extinguishing hers. The male was then captured and the female found later on some four or five feet away.

The other species on which observations were made by Dr. Withycombe, *P. extinctus*, is apparently more sluggish than *P. pellucens*, the insects sitting about among grass and rarely flying. Their thoracic lights are less brilliant and less constant, becoming gradually brighter from time to time and then dying away altogether, only to brighten again after a minute or so. After repeated observations Dr. Withycombe was unable to see any ventral light.

On one occasion, about 10.30 p.m., a male was observed flying rapidly to and fro over a space not more than a foot square, his thoracic spots flashing brilliantly and in rapid succession. Suspecting the presence of a female, search was made, but no female could be found. On the succeeding night, on nearly the same spot,

two insects were found about four inches apart in the grass, each emitting a dull light. These gradually faded, but on being disturbed brightened again. The beetles proved to be male and female.

On another occasion a male was seen flying slowly to and fro over a guava bush with his thoracic lights bright. Eventually he settled on a twig, when a female was found about eight inches further along the twig, with thoracic lights very feeble. The lights of the male diminished slightly after alighting, when he hesitated and walked away from the female for two inches or so, then turned round quickly and walked towards her. In the meantime the lights of the female had been completely extinguished. On reaching the female, whose head was directed away from him, the male climbed straight on to her back and immediately paired. He then slid down at once to her side, allowing himself to be suspended by his genital apparatus until, by further bending the apex of the body, he was able to grasp the twig behind the female and rest along it, tail to tail, in line with her. The lights of both insects were now extinguished. This was at 7.15 p.m. on 4th March, 1925; at 8.30 the pair had separated.

After alighting on the twig the male certainly did not find the female by sense of sight, since her lights were extinguished, and he first walked in the wrong direction. In fact Dr. Withycombe is of opinion that, though the light may serve to attract the male from a distance, on a near approach some sense analogous to smell, or similar to that exerted by moths or beetles in 'sembling,' is called into play. The case of the Lampyridae seems to be not dissimilar, the male, on a near approach, frequently exhibiting uncertainty as to the precise locality of the female.

It is to be noted, however, that the male seems to be simply attracted by the light of the female, as in the case of *Lampyris*, and Dr. Withycombe has observed nothing in the nature of a response from a waiting female to the lights of a passing male, as has been observed in the case of the Lampyrid fireflies, e.g. *Luciola* in Europe and *Photinus* and *Photuris* in America, yet the analogy of the ventral flashing light of the flying male would lead one to expect something of this nature.

The two species observed by Dr. Withycombe belong to separate groups within the genus *Pyrophorus*; in the *pellucens* group the two sexes are very similar, both showing in preserved specimens a large ventral light organ, and both exhibiting in flight a strong ventral light. In the *extinctus* group, on the other hand, the antennae in the male are considerably longer than those of the female,

and in preserved specimens of many species besides *extinctus* the abdominal light organ is very much reduced and in life is apparently not functional. In this group, as in other insects with exceptionally well developed antennae in the male, one may expect that the sembling sense would be better developed than in those with more reduced antennae, and the relatively feeble light emitted by the female *extinctus* would appear to support the theory that in the species of this group the sense of sexual perception in the males is seated in the antennae and is functional for some distance, whereas in the *pellucens* group the attraction from a distance is to the light of the female.

It is to be hoped that Dr. Withycombe will be able to continue his most interesting observations on these insects, and that they will be extended by other naturalists favourably situated for the purpose.

120 Sunningfields Road,
Hendon, N.W.4.
November, 1925.

A NEW TERMITOPHILOUS PHORID FROM INDIA.

BY H. SCHMITZ, S.J., VALKENBURG, HOLLAND.

Through the kindness of Mr. F. W. Edwards, of the British Museum, I have received for examination a series of small, wingless Phorids discovered by Mr. H. G. Champion in a termite's nest in India. I found them all to belong to the same species, namely, an undescribed *Puliciphora*, which comes very near *P. velocipes* m. (Entomol. Meddel., vol. x [1913], pp. 9-16, pl. 1). This species is undoubtedly truly termitophilous, and I propose to name it :—

Puliciphora termitum, n. sp.

♀. Frons broader than high, brownish, somewhat shining, with only 10 bristles, viz. : two pairs of proclinate supra-antennals and a vertical row of 6. These are arranged in the following manner : the two innermost bristles are placed directly behind the two rear ocelli and the distance between them is almost equal to the distance between these ocelli ; the intermediate bristle on either side is a little nearer to the outermost bristle than to the innermost one. The two profrontal bristles present in *P. velocipes* are wanting in the new species. All three ocelli of equal size. Compound eyes larger than in *velocipes*, with about 65 ommatidia in 8×10 cross rows. Antennae roundish, reddish-brown, with the apical arista distinctly pubescent. Palpi as in *velocipes*, brownish. On the sides of the oral cone there is a rudiment of a maxilla consisting of a slightly chitinated area with 6-7 fairly long bristly hairs along the anterior border, which same rudimentary maxilla I now find also present in *velocipes*. Thorax of the same shape as in that species, and usually of the same colour as the frons, but sometimes a little paler, always distinctly different

in colour from the deep black and shining abdominal tergites. The chaetotaxy of the thorax similar to that in *velocipes*; the dorso-pleural bristle and the bristle on the minute papilla-like wing-rudiment of nearly equal size. Abdomen oval, with 6 short and densely haired dorsal plates, which are not abbreviated laterally; the first of them very short. The lengths of these plates along the middle line are in the following proportions: 3, 35, 25, 25, 9. The small plate or flap on the opening at the base of the 5th tergite is relatively smaller than in *velocipes*; it has a width of 0.16 mm. along the anterior margin and a length of 0.06 mm. The width of the anterior margin of the 5th tergite itself is three times that of the flap, and the length of its middle line is perhaps a trifle more than three times that of the flap. The 6th tergite is broader than long; between the apodemes the anterior margin is somewhat concave. The apodemes are rather thin, more or less rod-shaped and divergent, having at the base a distance between them of 0.1 mm. and at the apex 0.16 mm. Venter dirty grey, on the posterior half with ordinary hairs. Legs brown, the anterior ones paler. Length 1.35 mm.

Described from twelve specimens which were found in termite-nests (?*Odontotermes obesus*) in India, Haldwani District, Kumaon, I, v., 1924, by Mr. H. G. Champion. Two syntypes (in one microscopical preparation) and six paratypes in the British Museum; four other paratypes in my own collection.

Valkenburg, Holland.

FOSSIL THYSANOPTERA, IV.—MELANOTHIRIPIDAE.¹

BY RICHARD S. BAGNALL, F.R.S.E., F.L.S.

In Part I of this series² I included the descriptions of *Melanothrips variicornis* (*varicornis* in error) and *M. annulicornis*, but did not feel justified at the time in creating new genera for their reception, although the form of antennae in neither case agreed with that of the recent species of *Melanothrips* proper, whilst it was impossible to examine the fore-tibiae for the characteristic armature of the genus. As their antennal structure approaches that of *Ankothrips* Crawford and *Cranothrips* Bagn. respectively more closely than *Melanothrips*, it may be safe to assume that the fore-tibial armature is absent in these specimens.

In the meantime I have received an important paper on 'Bernstein-Thysanoptera' from Priesner, in which he characterises two Melanothripid genera having undoubted affinities with *Ankothrips* and *Cranothrips*, and throwing further light on my material. I accordingly dissolved my specimens from their balsam cells and found that I could examine one side of each preparation under a one-eighth-inch objective, and so, in the light of this new material make a more exact generic interpretation. I am publishing a table and catalogue of the recent and fossil *Melanothripidae* elsewhere,

¹ Continued from E.M.M., vol. ix, p. 251, 252 (Nov. 1924).

² *I.c.*, lix, pp. 35—38.

but the main divisions of the family may be shortly cited as follows, an asterisk signifying fossil genera :—

1. Fore-tibia armed ; antenna with joint 5 noticeably smaller than 6, which is unusually large (never ringed with microscopic hair-set asperulae and no joint armed) *MELANOTHRIPS* Hal.
- .Fore-tibia unarmed ; antenna with joint 6 not noticeably larger than 5. 2.
2. Antennal joints 3-9 'ringed,' joint 1 simple or armed.
..... *CRANOTHRIPS* Bagn. and **EOCRANOTHRIPS* nov.
- .Antennae otherwise, the first 4 joints noticeably stouter than 5-9.
..... **OPADOTHRIPS* Pr., *ANKOTHRIPS* Crawf. and **ARCHANKOTHRIPS* Pr.

Priesner separates his genus *Archankothrips* from *Ankothrips* by the multi-articulate ninth antennal joint, an unexpected and inexplicable condition. My *M. variicornis* undoubtedly belongs to this genus, though the generic features had to be closely searched for under a high-power and special lighting with the aid of Priesner's diagnosis. The production of the second antennal joint in my specimen is shorter than in Priesner's *A. pugionifer* and not displayed laterally, but is overlaid by joint three, which is fortunately sufficiently transparent to show the presence of the underlying production, whilst the transverse sutures of the distal segment can only be seen under a high power.

GENUS *EOCRANOTHRIPS* nov.

Antennal joints 3-9 'ringed,' apparently formed of minute raised hair-set asperulae as in *Cranothrips* and *Opadothrips*, but not having the joints 1-4 noticeably stouter than the succeeding as shown in *Archankothrips* and *Opadothrips* but not in *Cranothrips*. Antennal joint 1 simple and not armed as in *Cranothrips*, and 3 and 4 also almost certainly simple and not armed as in *Opadothrips*.

TYPE, *Melanothrips annulicornis* Bagn.

Eocranothrips annulicornis Bagn.

The relative lengths of the antennal joints 5 to 9 are approximately :— 35, 36, 29, 19, 18. Joints 3 and 4 each with a short sense-area near apex as in *Cranothrips poultoni* Bagn.

But for the simple first antennal joint, the antennae agree in every way with those of *Cranothrips*.

Archankothrips variicornis Bagn.

This species differs from *A. pugionifer* Priesner in the stouter and shorter prolongation of the 2nd antennal joint which only reaches for half the length of joint 3. The antennal joints 1-4 appear to be broader than in *pugionifer*, 3 and 4 each being furnished with broad sense-area near apex without, and 5 and 6 with a short, stout, blunt sense-cone on outer side. The transverse sutures of the distal segment are present but indistinct.

The fore-wings are broader than in *A. pugionifer*.

November 1925.

NOTE ON THE SWARMING OF GNATS OR MIDGES
ROUND LOFTY TOWERS.

BY HUGH SCOTT, M.A., SC.D., F.E.S.

In the Entomologist's Monthly Magazine for January, 1925, p. 20, appeared a translation of a note by Dr. A. Thienemann which recorded the swarming of Chironomidae round the tower of a church in Holstein in such numbers that they were taken for smoke, and an alarm of fire was consequently given. A similar phenomenon has since come to my notice, in the repeated occurrence of swarms of gnats or midges round the top of the spire of Salisbury Cathedral. This spire, which is 404 feet* high, is the loftiest in England (and also one of the highest in the world, being exceeded in height by few, if any, besides Amiens, 422 feet, and Strasbourg, 488 feet). Unfortunately there is no information as to the exact nature of the flies composing the swarms at Salisbury, but it may be assumed that they are probably Chironomidae of some kind. The facts concerning them have been kindly given to me by the Rev. Dr. H. F. Stewart, of Cambridge, and the Rev. Canon H. R. W. Farrer, of Salisbury. Dr. Stewart saw the swarms on three very hot nights in succession, July 11th, 12th and 13th, 1925, from about 8.30 p.m. (summer time) till it grew too dark to see. The flies were right at the top, a few feet below the cross, and made an appearance as though the spire were on fire. Canon Farrer writes that the phenomenon only happens after spells of very hot weather, and that he had not noticed it since 1921; that the likeness to smoke is only observed when the insects are at or quite near the top of the spire, while it is increased by the swaying movement of the cloud of flies; and that people have more than once been deceived into thinking that the spire was on fire below and that smoke was coming out at the top. He also remarks that, although these insects reach a great height, yet swallows and swifts may be seen, apparently chasing flies, at still greater elevations, some hundreds of feet above the top of the spire.

The whole matter has some interest in connection with the general question as to the altitudes at which insects fly, a subject which has attracted attention from time to time. Of course, certain kinds of insects, which do not normally rise very far above the ground, may possibly wander upwards close to the surface of a high building, and consequently find themselves at a much higher level than they would if there were no elevated object in the vicinity. But, on the other hand, the tops of high places do

* About 123 metres.

seem to exercise a positive attraction on some forms of insect-life, as in the case of the bot-flies and male wood-wasps referred to in the note below.

University Museum of Zoology,
Cambridge.

November 30th, 1925.

Sirex gigas, *Gastrophilus equi* and other insects on bare mountain-tops.—

In several numbers of this magazine during the last few years (May 1923, p. 113; July 1924, p. 155; Sept. 1924, p. 213) attention has been called to the occurrence of males of *Sirex gigas*, one or more at a time, on the summits of treeless hills, at a considerable distance from woods and at elevations from 800 to 1,300 feet above sea-level. The summits where these male wood-wasps were taken are those of Rough Tor, Cornwall, 1,300 feet, Arthur's Seat, Edinburgh, 822 feet, and Roseberry Topping, North Yorks, 1,065 feet. I am now able to add a record of a *Sirex gigas* from a much greater elevation, though without complete certainty as to its sex, and, moreover, to mention several other species of insects, Hymenoptera, Diptera and Lepidoptera, which were present at the same time and place.

The mountain-tops in this case were the bare grassy summits of the Cader Idris range in Merionethshire, in particular the actual peak, or Pen y Gader, 2,927 feet, and a peak called Craig Lâs, 2,167 feet, about two miles due west. I ascended these on August 17th, 1925, a blazing hot day, when the heat was scarcely tempered even at the tops of the hills. A *Sirex gigas* was flying about on the very summit of Pen y Gader, and I was almost sure that it was a male, but could not be quite certain, as the only place on which I saw it settle was a projecting rock at the top of the great precipice overlooking Llyn Gader, where it was out of reach, and also had its wings closed over its back, concealing the body. The nearest woods are over 1,000 feet below and from one to two miles away. The other insects noted on the summit of Pen y Gader were the big Muscid fly, *Mesembrina meridiana* L., certain smaller flies, and two species of ants. The smaller flies were of the general type which may be designated 'tormenting flies,' that is, non-bloodsucking Muscid flies which follow people about the countryside, even at long distances from houses and cultivation. Such flies on this occasion continued, though in diminishing numbers, right to the summit of the mountain. Probably they were a species of *Hydrotaea*, but I prefer to say nothing further about them at present, as I have been for some years collecting samples, which I hope ultimately to get determined, with full data and from various places. The two kinds of ants were *Myrmica scabrinodis* Nyl. and *M. lobicornis* Nyl. Six males of the former were captured from a dense flying swarm on the cairn which crowns the summit; many ants appeared to be emerging from a crevice between the loose stones of which the cairn is constructed, some were pairing, and the flying cloud swarmed so thickly round my head that it was impossible to look at the view from that particular spot. One male and one (winged) female of *M. lobicornis* were taken, probably from among some scattered flying ants at a little distance from the cairn. I am indebted to Mr. Donisthorpe for identifying the ants, and the data will also be recorded by him elsewhere. The butterfly *Pararge megaera* was in evidence on the top of the mountain. The time at which these observations were made was 2.0 to 2.45 p.m. (summer time).

An hour or so earlier I had pill-boxed two males of the Horse Bot-fly (*Gastrophilus equi* F.), which hovered near me and then alighted in succession

on my clothes while I was sitting on the summit of Craig Lás. I think that others were hovering near by, though no horses were in sight anywhere. The attraction of bare mountain-tops for this insect and for some other Oestridae is well-known, and is alluded to by F. Brauer (Mon. Oestridae, 1863, pp. 28, 49, 57) and probably in other works. Brauer remarks that if a person walks about on a mountain-top for a little while, in the right season and in a district where these flies can exist, he is almost sure to see them; that they will almost rush on him, and then fly to and fro 'pendulum-wise'; that they rarely settle, and then most often on flowers of Compositae or on sun-heated stones (he does not mention the observer's clothes). He further remarks that he had met with females as well as males swarming in such places, the females usually on stormy days. I saw no female *Gastrophilus* on Craig Lás, but had seen several hovering round cart-horses a few days before, on some low hills not many miles away.—HUGH SCOTT, University Museum of Zoology, Cambridge: November 30th, 1925.

The III. International Congress of Entomology, Zürich, 19th-26th July, 1925.—The provisional committee on 'Nomenclature,' elected for the duration of the Congress, proposed, and the Congress, in its General Meeting of 25th July, unanimously passed the following Resolution:—

The Congress considers it desirable to express the opinion

(1) that in future (*i.e.* from the time when the revised rules of nomenclature have become law) it shall be compulsory for the publication of a new genus to be accompanied by a description of the genus as well as by the citation of an already known species or by the description of a new one; and

(2) that in future a new name published must be accompanied by a description in words (or a reference to a former such description) also in the case of Lepidoptera.

Dr. J. Waterston proposed and the Meeting unanimously agreed that this Resolution be sent to all Editors of Entomological Journals.

A new Irish Periodical.—The 'Irish Naturalist,' as stated in E.M.M., lxi, p. 44, was discontinued on the conclusion of the 33rd volume, in Dec. 1924. The 'Irish Naturalist's Journal,' the first number of which was issued in September last, will in some measure replace it. This new venture is described as the official organ of the Belfast Natural History and Philosophical Society, the Belfast Naturalists' Field Club, the Cork Scientific and Medical Society, the Dublin Naturalists' Field Club, and the Route Naturalists' Field Club. It is to be published bi-monthly by the I.N.J. Committee, and the subscription, 6/- per annum, post free, can be paid to the Hon. Treasurer, James Orr, 17 Garfield Street, Belfast. The first number contained a short entomological paper, entitled 'Bees and their Habits,' by A. W. Stelfox.—EDS.

Bolitochara mulsanti Sharp, a British Insect.—Recently examining four Staphylinid beetles, all mounted on the same strip of card, sent to me in December, 1894, by the late Mr. Morris Young, of Paisley, as *Bolitochara lunulata* Payk., I found that none was true to name, and that one was a specimen of the above-mentioned species. As I believe the insects to have been taken by Mr. Young in the neighbourhood of Paisley, it is desirable to publish an account of the circumstances of the case in the hope that the beetle may be re-discovered. According to Ganglbauer, *B. mulsanti* differs from *B. lunulata* in the sharply right-angled posterior angles of the thorax (a very obvious

character), the finer and more scattered puncturing of the head, and the absence of a keel on the 8th dorsal segment of the male. I have submitted the specimen to Dr. M. Cameron, R.N., who has kindly confirmed the identification of it.—JAMES H. KEYS, 7 Whimble Street, Plymouth: December 1st, 1925.

Viviparity of Lomechusa strumosa F.—Mr. H. F. Barnes in his interesting paper on the viviparity of *Chrysochloa gloriosa* F., in the November number of this Magazine, gives references to three papers on viviparity among beetles, and says these are the only others that have appeared in English. This, however, is not quite correct. In the Ent. Record [29, 50-51 (1917)] I pointed out that the myrmecophilous beetle, *Lomechusa strumosa* F., is viviparous, referring to two papers by Wasmann in which he first demonstrated this fact; and gave a short note on the subject, with my own experience.—HORACE DONISTHORPE, Putney: November 11th, 1925.

Gerris asper Fieb. in Cumberland.—This pond-skater having been seldom met with in the British Isles, its occurrence in a new district may be worthy of record. In June last I captured three specimens of *Gerris* on Thurstonfield Lough, a small lake near Carlisle, one being *gibbifer* Schum.; but the other two were new to me although I suspected they might be *asper* Fieb. I sent them to Mr. E. A. Butler, who, with his usual kindness, put himself to considerable trouble in the matter and confirmed the identification. This species is usually taken in a nearly apterous condition, but my specimens are macropterous and are, Mr. Butler tells me, exactly similar to specimens in the British Museum with which he compared them.—F. H. DAY, 22 Currock Terrace, Carlisle: October 19th, 1925.

Hemiptera in Glamorgan.—The most interesting capture of the past season has been an example of the var. *melas* Reut. of *Stenodema laevigatum* L. This specimen was swept, with several of the type form, from *Genista tinctoria* growing in long grass at Penarth on 8th August last. Mr. E. A. Butler, who has with his usual kindness gone over all my captures, tells me that this is the blackest example he has seen. Another of the type form taken at the same time shows distinct progress towards this variation.

The following species are additions to the census in Mr. Butler's recent 'Biology of the British Hemiptera-Heteroptera':—*Trapezonotus dispar* Stål: not uncommon at Taff's Well amongst dead leaves, 9.vii.24. *Nabis ericetorum* Schltz.: one larva at Porthcawl in August 1925. *Triphleps minuta* L.: one at Taff's Well, 9.vi.24. *Trigonotylus psammaecolor* Reut.: Porthcawl, on Marram grass in August 1924. *Phyllocoris dimidiatus* Kb.: one at Sully in August 1924. *Poeciloscytus unifasciatus* F.: common at Porthcawl on *Galium verum*, 4.viii.24. *Pilophorus clavatus* L.: local at Porthcawl on *Salix repens*, 26.vii.24. *Cyllocoris histrionicus* L.: beaten off *Quercus cerris* at Cwrt-yr-ala, 12.vii.25. *Heterocordylus tibialis* Hahn: plentiful on Broom at Taff's Well, 1.vi.25. *Tinicephalus hortulanus* Mey.: not rare on *Helianthemum* at Cwrt-yr-ala in August. *Psallus obscurus* Fall.: scarce at Sully on *Pinus*, 2.viii.25. *Chlamydatus saltitans* Fall.: one at Porthcawl, under Marram grass, 30.viii.25. *Notonecta furcata* F.: Penarth, in 1916, and at Porthcawl, 29.viii.25. *N. maculata* F.: Penarth, one in 1916 (D. Bacchus).—H. M. HALLIETT, 64 Westbourne Road, Penarth: November 2nd, 1925.

A Note on the Habits of Myiophanes tipulina Reuter (Reduviidae, Heteroptera).—*Myiophanes tipulina* Reut. is a hairy 'Crane-fly'-like bug belonging to the Reduviid sub-family Emesinae, and is a native of China and Japan.

The Emesinae have elongated front coxae and the front femora and tibiae are spined and adapted for grasping their prey in the same way as in the Mantids. The front legs are also held in the same manner as in the 'praying-insects.' The Rev. William Hunter of Kuangning, Manchuria, who has sent me a specimen of this interesting species, writes that it is called by the Chinese, 'Shui Dao Leng' or 'Shui Tang Lang,' which both mean Water-Mantis. It is found in swampy places and only ventures forth from its hiding-places at night, being apparently somewhat rare and seldom met with. These notes are interesting, because they show that the observant Chinese have noticed the similarity in the structure of the front legs, and in the habits, between this insect and the Mantis, in spite of the former's striking resemblance to a hairy 'Daddy-long-legs' fly. Other members of this group live amongst dense vegetation at the edge of water and are nocturnal in their habits, and this suggests how the closely allied *Myiophanes kempi* Ch., a species inhabiting the Siju Cave, Assam, and *M. speluncarum* Jean., which lives in similar caves at Shimoni and Kulumuzi in tropical East Africa, may have found their way up the streams flowing from the caves. These insects are found in complete darkness 500 feet from the cave entrances, and prey upon small moths (*Pyrallis* and *Tinea*), gnats and spiders (*Theridion*). *Ploiariola vagabunda* L. and *P. culiciformis* De Geer, which occur respectively in trees and in thatch and sometimes in houses, are British representatives of the group.—W. E. CHINA, British Museum (Natural History), Cromwell Road, S.W.7. : November 30th, 1925.

Further records of Hyperetes britannicus Harrison.—This is apparently a purely littoral Psocid, and was originally described from specimens taken on the coast at Grange-over-Sands. In July 1924 I found it at Speeton (Yorkshire) whilst in June 1925 it occurred to me on the coast south of Aberdeen and on St. Mary's Island near Whitley Bay, Northumberland. In all cases the species was not common and required close and careful search under tufts of fine grass, etc., close to high-water mark. Mr. Pearman informs me that his record was made in error.—RICHARD S. BAGNALL, Newcastle-on-Tyne : December 12th, 1925.

The Wood Collection of British Diptera and Lepidoptera.—Readers of this Magazine will be familiar with the work of the late Dr. J. H. Wood, of Tarrington, Hereford, many of the results of whose work on the insect fauna of his county were published in these pages. At his death, in 1914, the whole of his valuable collections of Diptera and Lepidoptera were bequeathed to the Hereford Public Museum, where they have remained until recently. Now, owing to the kindness of the Trustees and of the Hereford Museum Authorities, they have been placed as a loan in the Natural History Museum at South Kensington, where they will be readily be available for study.

The collection of Diptera is specially important, for not only is it perhaps the finest county collection which exists in this country, but it contains named examples in perfect condition of a great many rare species of various families which are not represented in the National Collection, including the types of practically all the new species introduced by Dr. Wood. The most important of these are of course the Phoridae, of which there is almost a complete set, though one or two types appear to be missing. Some undetermined Phoridae in the collection have been examined by Father Schmitz, and among them he has been able to recognise the following additional British species :—*Parastenophora atricola* Schmitz, 1 ♀, Stoke Wood, 30.iv.08; *Aphiochaeta cothurnata* Schmitz, 1 ♂, Stoke Wood, 2.vi.06; *A. pygmaeoides* Lundbeck; *A. rubella* Schmitz, Stoke Wood, 20.viii.06.

There are also a number of undetermined specimens of various families in the collection, some of these doubtless representing unrecorded British species. One such is *Mycetophila tridentata* Lundstr., of which there is a male from Stoke Wood, 9.x.05. This is a species much resembling *M. bimaculata*, but with a striped thorax and yellow hypopygium. The single specimen of *M. tarsata* Winn. (on which the species was introduced as British) proves on re-examination to be the same as *M. occultans* Lundstr. Both Dziedzicki's and Lundström's figures of this species seem to be poor and rather inaccurate, but there is no doubt both names apply to the same species, which must be known as *M. tarsata*.—F. W. EDWARDS, British Museum (Natural History): December 1925.

Extraordinary mating-habits in a mosquito.—In a remarkably interesting note published in the 'Transactions of the New Zealand Institute' (Vol. 54, pp. 400-406, 1923), Prof. H. B. Kirk describes his observations on the mating of the mosquito *Opifex fuscus* Hutton. This insect breeds in brackish-water pools on the rocky coasts of the North Island of New Zealand. As is well-known, the usual method of mating in mosquitoes is for the males to congregate in a dancing swarm and for a female to fly into the swarm and be seized by one of the males. From Prof. Kirk's account it appears that the case with *Opifex* is utterly different. The males, instead of flying in a swarm, skim about on the surface of the pool, hunting for female pupae which are about to emerge, sometimes even thrusting their heads beneath the surface and peering into the water. Having eventually found a mature pupa the male seizes it with his forceps and proceeds to slit open the pupal skin on the back of the thorax, thrusting the end of his abdomen inside and actually effecting copulation before the complete emergence of his consort from her pupal envelope. It seems that the large front claws are not used, as they are in other mosquitoes, for holding the female, but for fighting off rival males after a pupa has been seized, the proboscis also being used for the same purpose. Prof. Kirk found that this astonishing method of mating was not only the normal one for the species, but that if the females hatched out unaided (as they were easily able to do) the males as a rule took no notice of them. Although oviposition was not observed in nature, Prof. Kirk describes how one female was found under water, and even entered the water again when removed, remaining submerged in apparent comfort for half-an-hour. He regarded this as a case of non-development of the air-living instinct in correspondence with the change of structure from pupa to adult; to the reviewer it seems not improbable that the water may be entered for egg-laying, as is habitually done by some species of *Simulium*. Eggs were obtained in captivity and another remarkable fact is recorded, that the young larvae, contrary to the usual rule, hatch out tail first.—F. W. EDWARDS.

Protanurophorus pearmani Womersley: additional note.—In my description of this new species of Collembola (E.M.M., Nov. 1925, pp. 250-252) no mention was made of sensory organs on the last two joints of the antennae. Further examination of co-types, however, under somewhat higher magnification, shows that at the extremity of the fourth joint there is a small retractile stump resembling those found on the antennae of the Achorutidae. In *P. pearmani* it does not assume a knobbed form, and when exerted is a stump with parallel sides. There is also a single sensory club-shaped papilla situated sub-apically on the third antennal joint. I wish to take this opportunity of drawing attention to the fact that where indicated only by our initials after the respective paragraphs, the description of the genus *Protanurophorus* is mostly due to Mr. Bagnall, and his name also must be associated with this genus.—H. WOMERSLEY, Sunny Meads, West-Town, near Bristol: December 2nd, 1925.

Obituary.

Edward Albert Butler, B.A., B.Sc., F.E.S., died suddenly in his home at Clapham on Friday, November 20th, 1925. Born at Alton, Hants, on March 17th, 1845, his early years were spent at St. Leonard's, where he first went to school, and later at Ramsgate. He had none of the educational advantages which are now-a-days so universal, and it was his keen mind and love of study that made him what he was. Much of his interest in science he owed to his father, a man much in advance of his times as far as scientific thought was concerned. He matriculated at London University and obtained an assistant teachership at West Hill House, Hastings, in 1865 where he ultimately became Vice-Principal. In 1870 he obtained his B.A. degree (London), followed in 1872 by that of B.Sc., and subsequently he became a master of the University School, Hastings. He proved to be an excellent teacher, as is abundantly proved by the testimony of his many pupils.

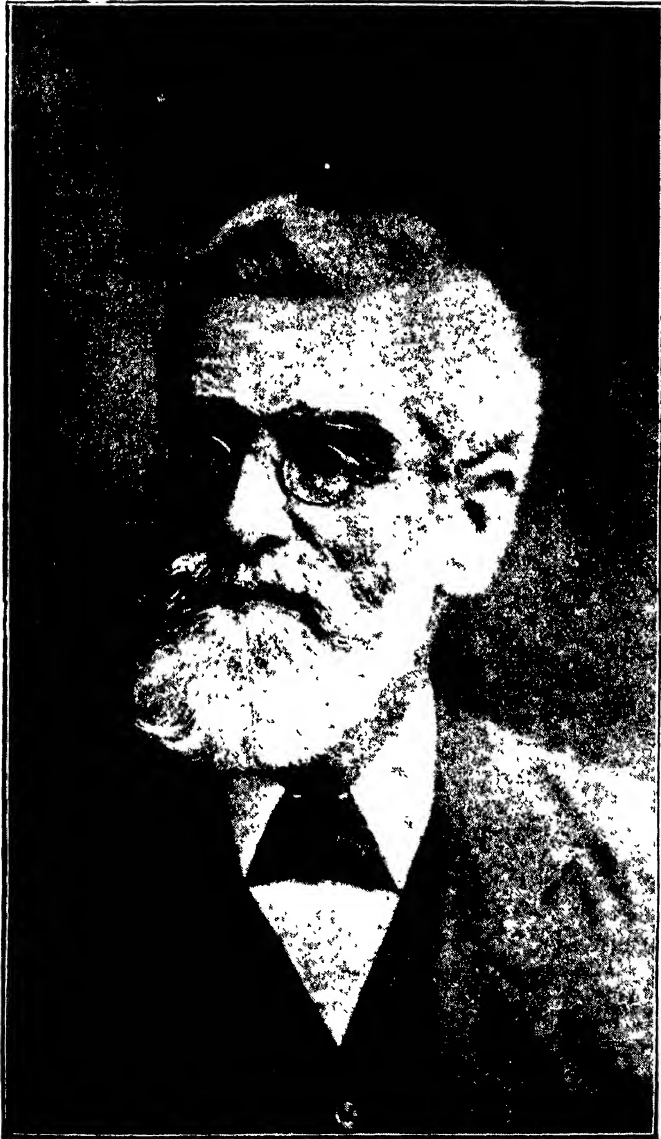
Mr. Butler was an excellent all-round naturalist and at Hastings he entered enthusiastically into the study of the local fauna and flora. It was during this time that, at the suggestion of the late Edward Saunders, F.R.S., he took up the study of the then much neglected order of insects, the Hemiptera. This study he diligently pursued for fifty years, working to within a few minutes of his death. In August 1877 he married Miss Lucy Porter, who, together with one son and his four daughters, survive him. Obtaining a mastership at the Tollington Schools, N., he came to London in 1883, and subsequently became Vice-Principal of the Schools. He retired in 1919 and went to live at Clapham, where he energetically continued his entomological studies. After the death of Edward Saunders in 1910 he naturally became the foremost authority on the British Heteroptera. He was particularly interested in the biology of the group and his numerous papers on the life-histories of the bugs bear witness to the powers of keen and patient observation which so admirably adapted him for this type of study. He was an ardent collector, and during his long and active life he added many new records to the British List, both in the Homoptera as well as in the Heteroptera. Although he had a fairly extensive collection of Continental and exotic Hemiptera he never undertook the description of the many new species which came into his hands; indeed he was pre-eminently a field naturalist and was content to leave the systematic work to his contemporary, W. L. Distant, who preferred it to the biological study of the British fauna. His collection of the various stages of British Heteroptera is absolutely unique, and it was upon the many years' work and research in this field that his book, 'A Biology of the British Hemiptera-Heteroptera,' published in 1923, was founded. This book is a landmark in the progress of the ecological study of the Hemiptera and is destined to become a classic of the subject. Its merits have been warmly praised both at home and abroad by all those competent to form an opinion on it.

For the past forty-five years he has been a frequent contributor to this Magazine, his first paper on 'Captures of Coleoptera and Hemiptera-Heteroptera at Hastings' having appeared in 1880, pp. 17, 68. In 1883 he joined the Entomological Society of London.

In the passing of Edward Albert Butler British Entomology suffers a severe loss and he will not readily be replaced. The whole of his British collections have been acquired by the British Museum (Natural History), where they are now available for study. A portrait of him is given with this notice.—W.E.C.

To face p. 24.]

[ENT. MO. MAG. 1926, PLATE I.



Edward A. Butler.

NOTES ON *HYPOLIMNAS BOLINA* L. IN THE PACIFIC ISLANDS.

BY C. L. COLLENETTE, F.E.S.

The following observations on *Hypolimnas bolina* were made during the 'St. George' Expedition to the Pacific in 1924-25.

Special notice was taken of the proportion of the sexes, having regard to the preponderance of females recorded in the Suva district of Fiji (Proc. Ent. Soc. Lond., 1923, pp. ix-xii).

TAHITI, February-March, 1925. There appeared to be two distinct broods of *H. bolina* inhabiting different zones in the Papeete district. The first occupied the level ground and the foothills up to some 500 feet. Here only three females were seen, but a careful estimate of the males gave between 200 and 300 in the same period. They were in extremely poor condition, but the females could be certainly recognised in flight. The second zone extended from 500 to 1,500 feet elevation in the hills, above which the butterfly was rare. In this zone the proportion was from three to five males to each female. They were in much better condition than those at a lower level, and the whitish band on the underside of the males was more strongly marked. Much rain fell prior to and during our stay. The rainfall is heavier in the hills than at the coast, but the difference is not sufficient to cause any noticeable change in the freshness of the vegetation.

HIVA OA, MARQUESAS, December 1924-January 1925. *H. bolina* was fairly common at lower levels, but in poor condition. Between 1,000 and 2,000 feet it occurred in smaller numbers but in better condition. From notes taken from day to day on the island, males proved to outnumber the females by about five to one.

FATU HIVA, MARQUESAS, January-February 1925. Males in small numbers at sea level, in very poor condition. None were seen inland, and no females were noted. There was no rain during our stay, and the vegetation was rather dry.

TAHUATA, MARQUESAS, January 1925. In small numbers, commoner near the coast than inland. In better condition than at Fatu Hiva. Males outnumbered the females by perhaps seven to one. Rain was frequent and vegetation fresh and green.

NUKA HIVA, MARQUESAS, January 1925. Fairly frequent, but not seen above 1,500 feet. In rather poor condition. About ten males were seen to one female. No difference in condition was noted between sea-level specimens and those inland. This was the driest island of the four, the inhabitants stating that no heavy rain had fallen for a year. The difference in rainfall in different parts of the Marquesas Archipelago is very striking.

MOOREA, SOCIETY ISLANDS, March 1925. Miss C. E. Longfield, of the 'St. George,' paid a short visit to this island, which is about eleven miles from Tahiti. Male *H. bolina* were common, while only two females were seen.

RURUTU, AUSTRAL ISLANDS, March 1925. No *H. bolina* were seen. A European who had spent a year on the island described 'a dark blue butterfly with four white spots,' which he said was fairly common at some seasons, and at once recognised a specimen from another island which was shown to him.

RAPA, April 1925. Fairly common in the narrow belt of level and generally marshy ground near sea level, where its food plant was common. On the hilly ground inland, where high winds prevailed, it was only occasionally seen, although the food plant occurred in sheltered places. The specimens caught were noticeably larger and finer than those from Tahiti and the Marquesas, and were in excellent condition. The sexes were in almost equal proportions, females being, if anything, slightly the more numerous.

It will be seen that on Rapa, where the butterflies had lately emerged, females were frequent, whereas on other islands, where they had been flying for some time and were in poor condition, males greatly predominated. This may indicate that males survive for a longer period than females, which is borne out by the fact that females captured were in better average condition than males.

LARVAE.—Larvae were found at Rapa, feeding on the Malvaceous plant, *Sida rhombifolia* L. (Kew specimen S.E.R.A. No. 774). Usually only one larva occurred on a plant, its dark colour making it very conspicuous, so that it could often be seen from a distance of several yards. They were of all ages, but no pupae could be found, although carefully searched for. Speaking of larvae seen at Fiji, Mr. G. F. Mathew says (Poulton, 'Mimicry in the butterflies of Fiji,' Trans. Ent. Soc. Lond., 1923, p. 648) that they 'seemed to be somewhat crepuscular in their habits, for I noticed that they ascended their food plant and became much more conspicuous towards sunset.' This did not seem to be the case at Rapa. Referring to larvae found in the morning and up to mid-day, my notes say: 'They were usually in full view, stretched out on the main stem or a subsidiary one, generally at rest, but occasionally eating.' Although the plants from which these larvae were taken were frequently passed in the late afternoon, and also after dark, no further larvae were found on them. As Rapa is outside the tropics, in latitude 27° 55' S., it may be that the heat of the sun at mid-day is not sufficiently strong to drive them to shelter.

Apart from spirit specimens, only those larvae which were nearly fully fed were taken, as the food plant could not be renewed after the 'St. George' had left the island. Of twenty larvae so taken, nine females and eight males were bred out, three failing to pupate before the food supply withered.

The description of the Marquesan larvae and pupae by Commander Walker (Trans. Ent. Soc. Lond., 1923, pp. 649-650) agrees well with Rapa specimens.

Sida rhombifolia was also noticed at Tahiti and the Marquesas, and is probably the food plant of the insect there. It was not seen at Easter Island, although a good look out for it was kept.

HABITS OF IMAGO.—Speaking of islands to the west of Tahiti, Mr. Mathew (Poulton, Trans. Ent. Soc. Lond., 1923, pp. 647-648) refers to the butterfly as a very fearless insect, the females, when sitting on flowers, being so tame that they would almost allow one to stroke them. I was therefore surprised to find the female in Tahiti and Rapa a very wary creature. It almost invariably took to flight, however cautiously it was approached, and was nearly impossible to catch when settled. The male was less shy, but was more easy to take in flight than at rest. Both sexes settled on leaves, and were not often seen on flowers. The males remained in flight more than the females, but in no case was either sex flushed from the vegetation without being seen previously, and in fine weather no case of settling under leaves (as mentioned by Mr. Mathew) was noticed. Two males were frequently seen flying round each other, but the two sexes were rarely seen in flight together.

I did not notice any cases of attack by birds or other enemies, but two or three of the specimens brought home seem to show evidence of damage from this cause. Mr. H. W. Simmonds, as quoted in Poulton's 'Mimicry in the butterflies of Fiji' (Trans. Ent. Soc. Lond., 1923, pp. 575-576) is inclined to attribute the scarcity of the butterfly in Viti Levu, Fiji, to some living enemy. The notes which follow deal with some of the possible enemies which he mentions, and are perhaps worth placing on record for future reference.

The introduced *Polistes* wasp was common on the four islands visited in the Marquesas, but was less frequent in Tahiti and Rapa, although often seen. The Indian Mynah, *Acridotheres tristis*, now widely distributed in the Pacific Islands, was common on Hiva Oa, but was not seen by our ornithologist, Lt.-Col. H. J. Kelsall, in Fatu Hiva, Tahuata or Nuka Hiva. It was especially

numerous in Tahiti, but was absent from Rapa. A large Warbler is fairly common in the Marquesas, but rather scarce in Tahiti. Two species of lizard were common in the Marquesas and at Tahiti, but were less frequently seen at Rapa. Neither of them usually frequented the stems and leaves of plants. Ants were not noticeably common, but I made no detailed notes on them.

Specimens of *H. bolina* illustrating these notes have been presented to the Hope Museum at Oxford.

Gothic Lodge, Woodford Green, Essex.

November 23rd, 1925.

PYRALIDINA AND TORTRICINA IN THE OXFORD DISTRICT.

BY E. G. R. WATERS, M.A., F.E.S.

The following notes are a continuation of those published on the same subject in this Magazine in 1914 (Vol. L, p. 240) and 1921 (Vol. LVII, p. 16). During recent years my attention has been concentrated mainly on the Tineina; but a number of noteworthy species belonging to other families of Micro-Lepidoptera have been met with incidentally. For convenience of reference the nomenclature of Staudinger and Rebel's 'Catalog' of 1901 has been adopted.

PHYCITINAE. Larvae of *Alispa angustella* Hb. were found commonly in Bagley Wood in September and October, 1921, feeding in the berries of a single bush of *Euonymus europaeus*, and a fair number of imagines were bred from them. *Hyphantidium terebrella* Zk., which I recorded from Tubney in 1920, proves to be an inhabitant of Bagley Wood also; since 1921 larvae have been found freely in the latter locality, in widely-separated parts of the wood. An example of *Hypochalcia ahenella* Hb., not previously noticed nearer to Oxford than the chalk downs, was taken in Holton Pits on June 27th, 1924. *Salebria betulae* Goeze turns out to be a widely-distributed, almost common, species in the Oxford district, although the moth itself is rarely captured; by searching birch-trees systematically in May and June, 1923, I found larvae in good numbers at Cothill, in Hen Wood and various other spots round Boar's Hill, the following year also in Waterperry Wood. Not only are the larvae of this species conspicuous, but the pupae also, ensconced among the leaves in a dense web of white silk, are particularly easy to detect. *Cryptoblabes bistriga* Hw. continues to occur regularly in Bagley Wood, and I have this autumn found the larvae commonly there. Although the larva of this species reveals its presence very clearly by the manner in which it skeletonizes the oak-leaves, it is none too easy to collect, owing to its habit of retreating hastily into an inconspicuous silken tube on the approach of danger.

PYRALINAE, SCOPARIINAE, PYRAUSTINAE. Not much progress has been made with these groups. *Hypsopygia costalis* F. has been found fairly commonly in Bagley Wood, far from any thatch or farm-buildings. A female specimen of *Scoparia dubitalis* Hb., found on June 20th, 1924, among normal specimens on a tree-trunk in Tubney Wood, comes very close indeed to **ab. purbeckensis* Bnks., though the white sub-basal and posterior fasciae (characteristic of this

aberration) are not quite such a pure white as in Dorset examples. Some surprise may be caused by the occurrence of this aberration so far from the south coast; but the Scopariids seem particularly liable to this sort of variation, which is found not only in *S. frequentella* and *S. dubitalis*, but also in *S. ambigialis* (ab. *crossi* Bnks.), *S. alpina* (a beautiful specimen, from the Shetlands, in the Bankes collection at South Kensington), and others. *Pyrausta fuscalis* Schiff. has occurred commonly among *Melampyrum pratense* in Waterperry Wood. *Pyrausta nigrata* Sc. was common at Holton Pits in the summer of 1925.

PTEROPHORIDAE. **Oxyptilus parvidactylus* Hw. has been taken commonly on the chalk at Streatley. *Alucita tetradactyla* L. occurs in a field near Stow Wood (Oxon.), *Pterophorus lithodactylus* Tr. among *Inula dysenterica* near Forest Hill (Oxon.) and on the outskirts of Shabbington Wood.

TORTRICINAE. Somewhat more has been seen of *Acalla hastiana* L., a few specimens having been bred from larvae found on *Salix viminalis* at Yarnton; but the species continues to be much less common here than might be expected, and the forms obtained are of little interest. An example of the moth came to the lighted window of my study on Feb. 1st, 1921. Larvae or imagines of *A. logiana* Schiff. have been found commonly on *Viburnum lantana* in Bagley and Tubney Woods and at Cothill. A few moths of the dwarf summer brood may be taken, but it is not until October that the moth is at all plentiful. I captured a worn (presumably hibernated) specimen in Bagley Wood on May 25th, 1922. The variation is disappointing, the great majority of specimens being of the unicolorous dull grey-brown form. An example of the uncommon *A. variegana* Schiff. ab. *albana* Westw. was captured at Glympton near Woodstock on Sept. 20th, 1920. *A. shepherdana* Sph. has been ascertained to occur among meadow-sweet at Cothill, as well as at South Hinksey; there is a good series of this species, bearing the 'Oxford district' label, in the collection of the late Professor Geldart (now in the University Museum). *Cnephasia conspersana* Dgl. was recorded erroneously in 1914 from a form of *C. chrysanthæana* Dup.; it figures in the Berkshire list, but there is no evidence of its occurrence near Oxford. *C. pasivana* Hb. proves to be a generally distributed species in this district, and there is no difficulty in separating it from *C. incertana* Tr. It is likely that the specimens referred to in 1914 under the name of *C. abrasana* Dup. are merely dark unicolorous examples of *pasivana*. *Abrasana* is a mysterious species, and there seems to be no evidence of its occurrence in Britain at the present time; it is said by Barrett to be attached to *Genista tinctoria* and *G. anglica*, but the only *Cnephasia* I have managed to breed from these plants is the common *C. virgaureana* Tr.

CONCHYLINAE (PHALONINAE). Satisfactory progress has been made with this group, which is one of the best represented in the district. A single specimen of *Lozopera francillana* F. (a rare species about here) was captured on July 21st, 1921, in a meadow near Forest Hill. Several examples of *Conchylis* (*Phalonia*) *manniana* F.R. (as diagnosed by Meyrick) were found at Kennington (Berks.), and one at Cowley Bog (Oxon.) in late June, 1925. The same locality at Kennington—a small strip of rough ground where I had never previously thought it worth while to collect—produced last summer quite a number of rare or local insects, the most noteworthy of which is **C. flaviciliana* Wilk. A score of this species were found there, at various dates between June 28th and July 21st, either flying among *Scabiosa arvensis*, or disturbed from some low bushes near by. The spot is a good many miles distant from any chalky soil, to which this moth is usually stated to be confined. It is greatly to be hoped that this beautiful insect, which is unknown on the Continent, and in England

is restricted to the south-eastern counties, may be extending its range. *C. udana* Gn. has been found commonly at Binsey, along muddy ditches and river-banks where *Alisma plantago* grows. Several specimens of *C. implicitana* Wck. were taken in a fallow field at Boar's Hill in August, 1922. *C. badiana* Hb. was found commonly at Tubney in July, 1925, also at Cothill and Cumnor, in each case among burdock. A specimen of *Euxanthia zoegana* L., which is of course common enough on the chalk, was found on June 21st, 1922, in a meadow at Binsey—an unexpected locality.

OLETHREUTINAE. *Olethreutes branderiana* L. is frequent among young aspens in Bagley and Waterperry Woods; I found larvae commonly in the former locality at the beginning of June, 1925, and bred several moths. *O. cespitana* Hb., previously recorded from Wytham Woods, has been detected also on the chalk at Streatley, where I found a few on July 14th, 1923. Some fine specimens of *O. antiquana* Hb. were captured by the Upper River above Binsey on June 25th, 1921, and a nice example of *O. ericetana* Westw. near Shabbington Wood on July 1st, 1925. A single female specimen of **Polychrosis euphorbiana* Frr., in perfectly fresh condition, was taken in Bagley Wood on June 2nd, 1921, flying in evening sunshine over its food-plant, *Euphorbia amygdaloides*. There seem to be few British records of this pretty species except from the West of England. The larva, which feeds on the shoots, ought not to be difficult to find, but has hitherto eluded me. A Tortricid which I dislodged from a juniper bush (whence it fell straight to the ground) at Streatley on April 24th, 1924, proved to be a beautiful specimen of the rare **Steganoptycha pauperana* Dup. A few weeks later I found larvae, which may possibly have been this species, feeding in flowers of *Rosa canina* in the same spot, but was not able to keep them alive. *S. fractifasciana* Hw., usually a chalk-frequenting species, was common in 1925 at Holton Pits, the spring brood in May and the summer brood in July. It is rather common also at Streatley. **Gypsonoma neglectana* Dup., which is common enough by the Upper River at Oxford, has also been taken in a Berkshire locality, at South Hinksey. *Bactra furfurana* Hw., of which only odd specimens had previously been taken in Oxford, was discovered in June, 1925, to be common in a meadow at Binsey among *Eleocharis palustris*, and in the same month I found a specimen at Cowley Bog. *Notocelia tetragonana* Sph. occurs regularly but sparingly in Waterperry Wood. Several specimens of **Epiblema caecimaculana* Hb. were captured among *Centaurea* at Streatley on Aug. 5th, 1922. *E. cinereana* Hw. abounds on the trunks of black poplars in Bagley Wood, and occurs also at Godstow. Four examples of **Grapholitha microgrammana* Gn., all in good condition, were captured on June 28th and 30th, 1925, at Kennington, in the same spot as *Conchylis flaviciliana*, *C. maniana*, etc. I was much surprised to meet with this species here, having previously found it only on the Kentish coast; but it is an obscure insect and easily overlooked. New localities for *C. internana* Gn. are Cothill (one on June 3rd, 1923) and Streatley (one, a female, on June 7th, 1924); I cannot, however, account for its presence on the downs at Streatley except by supposing that it had been introduced with some dead furze used for roofing shelters. A single specimen of **Pamene gallicolana* Z. was captured in Bagley Wood on June 14th, 1921, flying high among oaks; there is an example of this species, bearing the 'Oxford district' label and dated 1897, in the Sidgwick collection in the University Museum. **P. oxsenheimeriana* Z. was discovered in Bagley Wood by myself in early June, 1922, and later independently by Mr. O. W. Richards; it is rather common there along a row of spruces, but is easily overlooked among the swarms of *Epiblema tedella* and *Steganoptycha nanana* which

accompany it. *P. germmana* (*germarana*) Hb. has been taken in Bagley and Waterperry Woods, and was common in early June, 1921, among low willow bushes near Shabbington Wood.

In addition to the above records, most of the woodland species previously recorded from North Berkshire have been found in woods on the Oxfordshire side of the river, many also from the neighbouring part of Buckinghamshire; for instance, *Acalla literana* L., *Cacoecia crataegana* Hb., *Lobesia permixtana* Hb., *Epiblema ophthalmicana* Hb., *Grapholitha servillana* Dup., *Ancyliis diminutana* Hw. and *Pamene nitidana* F. More has also been seen of *Dichelia grotiana* F. (fairly common among oaks in Bagley Wood, July 1922), *Pandemis cinnamomeana* Tr. (Bagley Wood), *Conchylis hartmanniana* Cl. (common near Shabbington Wood), *Olethreutes corticana* Hb. (Bagley Wood), *Gypsonoma aceriana* Dup. (Pangbourne, July 26th, 1920), *Epiblema sordidana* Hb. (among alders at Cothill), *Grapholitha coniferana* Rtz. (Tubney Wood and Warren), *Ancyliis laetana* F. (general on aspen), *Pamene fimbriana* Hw. (Cothill and Tubney), and many others.

The asterisk (*) indicates an addition to the Berkshire list.

184 Woodstock Road, Oxford.

December 25th, 1925.

ADDITIONS TO THE LIST OF BRITISH CRANE-FLIES.

BY F. W. EDWARDS, F.E.S.

During the examination of the Tipulidae in the collections of the late Mr. F. Jenkinson and Dr. D. Sharp, which I recently undertook for the Cambridge Museum, a rather surprising number of species new to Britain has come to light. These are now recorded, together with a few others, including three from the collection of Mr. J. J. F. X. King and two from that of the late Dr. J. H. Wood. The type of *D. caledonica*, as well as many of the other specimens, have been generously presented to the British Museum by Dr. H. Scott.

1. *Dicranomyia caledonica*, sp. n.—Belongs to the group of *D. morio* F., and closely resembles that species except in the following particulars:—Last few segments of antennae longer, especially the terminal one, which is quite twice as long as the penultimate and is distinctly narrowed on its apical half. Posterior coxae mostly blackish, and covered with a fine greyish pubescence like that of the pleurae, whereas in *D. morio* they are mostly yellowish, and rather strongly shining, without fine pubescence. Abdomen stouter and completely black above and below, without any trace of pale hind margins to the segments. Hypopygium (fig. 1 c) differing in details, most conspicuously in the large blunt parameres and the form of the aedeagus.

Type, ♂, from Nethy Bridge, Inverness, vi-vii.1906 (*D. Sharp*); also 1 ♀ from Loch Assynt, Sutherland, i.vi.1911 (*Lt.-Col. Yerbury*).

For comparison with the new species I give figures of the hypopygium of *D. morio* (fig. 1 a) and also of the species which I identified in 1921 as *D. submorio* Alex. Having some doubt as to the strict identity of a Scottish with a Japanese species, I wrote asking Dr. Alexander's opinion, and he has kindly lent me the type slide of *D. pseudomorio* for comparison. From this it appears that although our insect is clearly the western representative of *D. pseudomorio*,

yet there are distinct differences, which make it advisable to treat it as a distinct species. I therefore name and diagnose it as follows:—

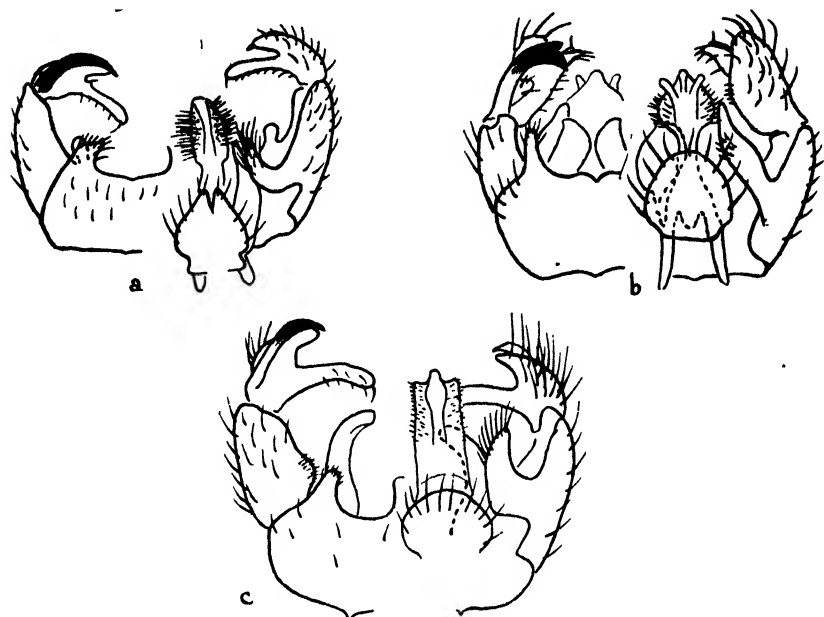


Fig. 1. Hypopygium, from above and below, of (a) *Dicuronomyia morio* F.; (b) *D. occidua* sp. n.; (c) *D. caledonica* sp. n.

Dicuronomyia occidua, sp. n.—Belongs to the group of *D. morio* F., differing in venation, *Rs* being usually well over twice as long as the first section of *R*₄₊₅, while in *D. morio* it is about 1.5 times as long; also in the more extensive pale colour on the venter, sternite 2 being entirely ochreous, and in the very different hypopygial structure, as shown in figs. 1 a and b. From *D. pseudomorio* Alex. (Japan) it differs in the scarcely tinted wings and in the details of the hypopygium; the 'peg-like organ' on the rostrum of the fleshy clasper is represented by a stiff hair only, and the ventral appendages of the side-pieces taper to the tip instead of being clubbed.

Type, ♂, from Ingleton, Yorks., 20.vi.1924 (F.W.E.); also 3 ♂♂, 1 ♀ from Loch Assynt, Sutherland, 10-11.vi.1911 (Lt.-Col. Yerbury) and 1 ♂ from Cusop Dingle, Hereford, 25.vi.02 (J. H. Wood).

2. *Rhabdomastix (Sacandaga) laeta* (Lw.).—One male from Aviemore, Inverness, 20.vi.03 (King). A fair-sized ochreous species suggestive of *Dicuronomyia lutea*, thus differing conspicuously from the other British species (*R. schistacea*) which is only half as large and blackish-grey.

3. *Ilisia melampodia* Lw.—Two pairs from the Monnow Valley, Herefordshire, 30.v.1911 (Wood). This is very distinct from the other British species of *Ilisia (Acyphona)* by the wholly black body and legs and the somewhat banded wings.

4. *Ilisia obscuripes* Zett.—One male of this little-known insect from Nethy Bridge, Inverness, vi.1907 (Sharp). In this species the wings are unmarked, as in *I. areolata*, from which it differs in its larger size and darker colour, dense though rather short whitish pubescence on the sides of the abdomen and the posterior margins of the tergites, open discal cell, genital structure, etc.

5. *Crypteria* (*Neolimnophila*) *placida* Mg.—Goetghebuer has recently (Bull. Soc. Ent. Belge, 1924, p. 84) distinguished under the name *ultima* O.-S. a species extremely similar to *C. carteri* Tonn., but differing in having four more or less distinct brown stripes on the thorax, and the radial cross-vein placed on R_2+3 instead of well behind the fork on R_2 . After examining several specimens of both forms I am inclined to agree with Goetghebuer in distinguishing two allied species, and also in regarding one of them as identical with the North American *Limnophila ultima* O.-S. I think however that Meigen's name *placida* should be used for this form. The type of *placida* in the Paris Museum is fragmentary, but the thorax shows four distinct stripes (as indicated in the description) and r is placed at the fork of R_2+3 and not beyond it. My notes on Zetterstedt's types also indicate that his *L. hyalipennis* is synonymous with *placida*. Of this species I have seen two British examples: a male from Calnwood, Herefordshire, 15.vii.97 (Wood) and a female from Sherwood Forest, ix.1922 (F. W. Edwards). The hypopygium of the male differs slightly from that of *C. carteri* and agrees with an American male of *L. ultima* which I have examined. On the other hand de Meijere's figure of *L. placida* apparently refers to *C. carteri*.

5. *Pilaria meridiana* Staeg.—One male from Nethy Bridge, Inverness, 28.viii.06 (King). Distinguished from all other British species of *Limnophila* (sens. lat.) by the absence of cell M_1 , and from the other three species of *Pilaria* by its much smaller size and the black longitudinal stripe across the pleurae.

7. *Adelphomyia fuscula* (Lw.).—In his revision of Palaearctic Limnobiinae de Meijere concludes that Loew's *Cladura fuscula* is the same species as *Adelphomyia senilis*, agreeing in this respect with Bergroth and Verrall, but differing from Nielsen, who endeavoured to distinguish *fuscula* from *senilis* by its smaller size, narrower wings and absence of tibial spurs. After examination of a fair amount of material I find myself in agreement with Nielsen that the two are different; the presence or absence of minute tibial spurs may not be constant, but contrary to de Meijere's statement there is a very marked difference in the structure of the aedoeagus between the two species. The one which I regard as *fuscula* also differs from the commoner *senilis* in the lighter colour of the thorax, with less distinct grey dusting and no dark patch on the mesosternum. I have seen the following British material: 3 ♂, Logie, Elgin, 24.ix.04 and 12.ix.13 (Jenkinson). 1 ♀, Catacol, Arran, ix.1920 (Waterston). 1 ♂, Crowborough, Sussex, ix.1915 (Jenkinson). Other specimens kindly sent me by Mr. Peder Nielsen from Ry, Denmark, agree in all respects with the British examples.

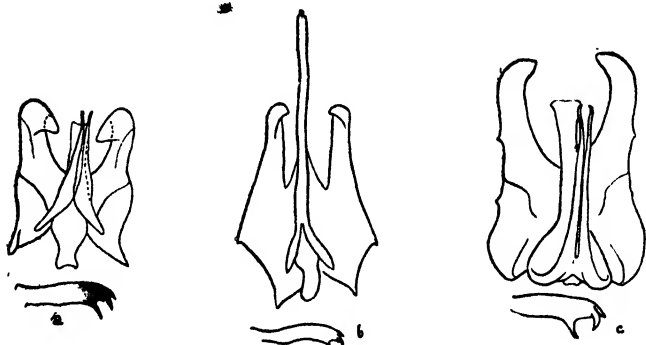


Fig. 2. Aedoeagus and clasper of (a) *Adelphomyia senilis* (Hal.); (b) *A. nielseni* (Kuntze); (c) *A. fuscula* (Lw.).

8. *Adelphomyia nielseni* (Kuntze).—Kuntze described from Danish material a *Gonomyia nielseni* which de Meijere regarded as another synonym of *Adelphomyia senilis*. We have in Britain a third species of *Adelphomyia* which in almost all respects answers to the description of *G. nielseni* and which I consider as that species. It is perfectly distinct from the other two, the differences being as follows:—Size smaller (expans. wing barely 4 mm.); colour lighter (pleurae almost uniformly ochreous). Wings narrower: membrane almost bare, having only about a score of hairs at the tip, none in cells *Cu*₁ or *Cu*₂. *Sc* faint at the tip and devoid of macrotrichia. Cell *M*₁ absent or extremely short (in five of the seven specimens examined it is absent on both wings, while I have never seen a specimen of *A. senilis* or *A. fuscula* without it). *Ax* shorter, ending distinctly before the base of *Rs*, consequently the axillary cell is smaller and narrower. Male claspers with the two teeth much shorter; aedoeagus quite different, the penis very long and slender. British material: 1 ♂, 1 ♀, Crowborough, Sussex, ix.1915, and 1 ♂, Logie, Elgin, 18.ix.05 (*Jenkinson*). 1 ♂, Duntocher, Glasgow, viii.1924 (*Cuthbertson*). I am also indebted to Mr. Peder Nielsen for 2 ♂, 1 ♀ from Silkeborg, Denmark, which are in every way similar to ours. Kuntze's statement that the front *metatarsi* are as long as the tibiae is evidently a misprint for *tarsi*. On account of the almost bare wings and faint marginal cross-vein, the species might easily be taken for a *Gonomyia*, and indeed the description of *Gonomyia lurida* Lw. corresponds so nearly to our insects that I should not be surprised if his species proves to be the same; the vein *R*₁ however is much longer than he states is the case in *G. lurida*. Each of our specimens shows a single minute spur on the middle and hind tibiae, such as is normally present also in the other two species.

9. *Nephrotoma aculeata* (Lw.).—One female from Logie, Elgin, viii.1903, and two from Forres, ix.1900 (*Jenkinson*). This species resembles *N. analis* and *N. lunulicornis*, differing in the sharply-pointed ovipositor and in the separate dark spot below the end of the lateral mesonotal stripe. The genus *Nephrotoma* as now used includes *Pachyrrhina*.

10. *Tipula macrocera* Zett.—Two males from the Black Mountains, 8.v.1901, in rush beds, and two from Haugh Wood, Herefordshire, 16.iv.98 (*Wood*). This unexpected addition to our fauna is not unlike the common *T. obsoleta* Mg., but has longer antennae and the middle thoracic stripe is undivided.

11. *Tipula vafra* Riedel.—A pair taken together at Logie, 13.ix.04, and another female from the same place, viii.03 (*Jenkinson*). A species very similar to *T. signata* and *T. alpium*, differing in male genital characters.

12. *Tipula microstigma* Pierre.—One female from Lyndhurst, 1.vii.1901 (*Jenkinson*). This is very distinct from all other British species by the almost unicolorous wings (only marked by a dark stigma preceded by a small paler area) in which *R*₂ is incomplete, not reaching the costa.

13. *Tipula pseudovariipennis* Czizek.—Five males and three females are in the British Museum, from Lyndhurst, New Forest (*Yerbury* and *Adams*), taken on various dates between May 21st and 30th. Although compared by its describer with *T. variipennis* it seems to be rather more like *T. hortulana*, from which it differs in the black instead of reddish under-side of the proboscis, and in the presence of a more or less distinct median dorsal abdominal stripe, as well as in the more or less darkened first antennal segment.

14. *Dicranomyia consimilis* Zett.—One male from Aviemore, 23.viii.1903 (*King*). This might easily be passed over as a dark specimen of *D. didyma* Mg., from which it is separated by its somewhat longer antennae with much longer verticils, as well as the shining thorax and slightly different wing-markings:

the spot over middle of *R* is larger and reaches the costa, and there is hardly a trace of a dark cloud at the tip of the wing.

15. *Prionocera pubescens* (Lw.). One male from the Bristol district, 1924 (*H. Womersley*). This does not appear to have been met with since it was described by Loew in 1844 from Posen, but may have been confused with *P. turcica*. From this it differs in its entirely black rostrum and antennae; third antennal segment also shorter, and the flagellum rather more serrate; head and thorax much more hairy; hypopygium smaller and formed more like that of *P. serricornis*.

British Museum (Natural History).

December 1925.

A NEW SPECIES OF *Dixa* FROM SUSSEX (DIPTERA, CULICIDAE).

BY F. W. EDWARDS, F.E.S.

The British species of *Dixa* at present known fall into two groups—those in which the wings are clear and the first flagellar segment of the antennae long and slender, and those in which the wings have at least a central dark spot and the first flagella segment is shorter and rather distinctly thickened. All of them have the *r-m* cross-vein close to and usually just beyond the end of *Rs*. The new species described below is distinct from all the others by combining spotted wings with slender antennae, and further in having the *r-m* cross-vein well before the end of *Rs*. In its venation it resembles the European *D. obscura* Lw., which is a black species with clear wings.

Dixa filicornis, sp. n.

♀. *Head* blackish, somewhat dusted with grey. Antennae and mouth-parts dark brown, only the base of the first flagellar segment yellowish, this segment quite slender and cylindrical, ten times as long as broad and over twice as long as the following segment. *Thorax* with the ground colour of the mesonotum clear yellowish, without grey shimmer; three well-separated black stripes, the middle one divided posteriorly by a yellow line, entire in front. Scutellum yellowish; postnotum dark; pleurae mostly dark brown; pronotal lobes pale beneath. Pubescence scanty, dark. *Abdomen* dark brown, including the inconspicuous anal and genital parts. *Legs* ochreous-brown, tips of femora and tibiae rather indistinctly darkened; hind tibiae not conspicuously swollen at the tip. *Wings* with a rather large central dark brown spot, evenly spread on both sides of the cross-vein; an indistinct cloud in the basal half of cell *Cu*, and a narrow dark seam edging some of the veins, most noticeable on *Rs* and *R2+3*. *Rs* more oblique and *R2+3* more strongly arched than in the other British species, so that the marginal cell is extremely broad above the cross-vein; *r-m* placed well before the end of *Rs*. Halteres ochreous. Wing-length 4.5 mm.

Type, ♀, from Crowborough, Sussex, 8.i.1903 (*F. Jenkinson*). Presented to the British Museum by Dr. H. Scott.

British Museum (Natural History).

December 1925.

STUDIES ON CLYDE CRANE-FLIES: THE SWARMING OF CRANE-FLIES.

BY ALEXANDER CUTHBERTSON, C.D.A. (GLAS.).

Our knowledge of the bionomics of *Diptera* is exceedingly slight, and very few ecological data are available in the literature on crane-flies in the Clyde area. In this paper the swarming of forty species is recorded and a detailed account given of one species, *Erioptera taenionota* Mg.

SPECIES OBSERVED SWARMING.

<i>Anisopus punctatus</i> F.	<i>Empeda flava</i> Schum.
<i>Trichocera annulata</i> Mg.	„ <i>nubila</i> Schum. ♀.
„ <i>hiemalis</i> Deg.	<i>Erioptera flavescens</i> Mg. ♀.
„ <i>fuscata</i> Mg.	„ <i>fuscipennis</i> Mg. ♀.
„ <i>regelationis</i> L. ♀.	„ <i>taenionota</i> Mg. ♀.
<i>Antocha vitripennis</i> Mg.	„ <i>trivialis</i> Mg. ♀.
<i>Dicranomyia autumnalis</i> Staeg.	<i>Gonomyia dentata</i> de Meij.
„ <i>chorea</i> Mg. ♀.	„ <i>tenella</i> Mg. ♀.
„ <i>didyma</i> Mg. ♀.	<i>Symplectomorpha stictica</i> Mg. ♀.
„ <i>dumetorum</i> Mg.	<i>Molophilus appendiculatus</i> Staeg.
„ <i>modesta</i> Mg.	<i>Rhypholophus haemorrhoidalis</i> Ztt.
<i>Limnobia flavipes</i> F.	„ <i>varius</i> Mg.
„ <i>nubeculosa</i> Mg. ♀.	<i>Ormosia lineata</i> Mg. ♀.
<i>Rhipidia maculata</i> Mg.	„ <i>nodulosa</i> Mcq.
<i>Limnophila nemoralis</i> Mg. ♀.	„ <i>uncinata</i> Meij.
<i>Idioptera marmorata</i> Mg. ♀.	<i>Dicranota bimaculata</i> Schum.
* <i>Epiphragma picta</i> F.	„ <i>guerini</i> Ztt.
<i>Cheilolrichia imbuta</i> (Wied.) Mg. ♀.	<i>Tricyphona claripennis</i> Verr.
<i>Ilisia areolata</i> Siebke. ♀.	„ <i>immaculata</i> Mg. ♀.
„ <i>marmorata</i> Mg. ♀.	„ <i>unicolor</i> Schum.

GENERAL DISCUSSION OF SWARMING ACTIVITIES.

In the Clyde area, as observed by the writer, the swarming of crane-flies is conspicuous and widespread in the Anisopodidae and the Tipulidae (sub-family Limnobiinae), and does not occur in the Ptychopteridae and the sub-family Tipulinae. Most of the species concerned are numerically common and widely distributed. The climatic conditions necessary for the swarming of many common species (as *Trichocera regelationis* L. 'the winter gnat,' *Dicranomyia chorea* Mg., *Erioptera taenionota* Mg., *Ormosia lineata* Mg. and others) appear to be a calm, dry evening following a period of wet weather. Swarming takes place in close proximity to the larval habitat, especially noticeable in species which are soil-dwellers in the larval stage, as *Limnophila nemoralis* Mg., *Gonomyia tenella* Mg., and *Erioptera fuscipennis* Mg. Generally woodland species swarm in the shaded parts of paths. The swarm numbers only a little more than six or so at first, in the late afternoon, and is augmented by the arrival of newly-emerged adults, until in the

* HENDERSON, R. (1906), Trans. Nat. Hist. Soc. Glasgow, Vol. VIII (N.S.), Pt. I, p. 9.

even at sunset several hundreds of individuals take part. Of the forty species herein recorded, thirty-two references to mating while swarming were made by the writer in the course of field work, and are indicated in the above lists by the sign ♀. Alexander (1920) gives an excellent résumé of the swarming activities of New World crane-flies; and Johnson (1909) gave the name of 'the king of the dancing tipulids' to a Tipuline crane-fly, *Brachypremna dispellens* Walk., which is allied to our graceful *Dolichopeza albipes* Ström.

THE SWARMING OF *ERIOPTERA TAENIONOTA* MEIG.

The method of mating during swarming of *E. taenionota* may be typical of this habit in the smaller Limnobiine crane-flies, and is discussed in detail from observations made at Meikle Kilmory Farm, Isle of Bute, on July 19th, 1925. 4.30 p.m. : A small swarm of ten to twenty individuals observed in shade low over moist soil at the margin of the intermittent burn from the reservoir. Teneral imagines were found crawling on moss on bank of the burn, and on moist sandy soil at water's edge (the larval habitat). No mating observed. 6.30 p.m. : The swarm had greatly increased; the net drawn through the swarm at random captured forty males and fifteen females. At 7 o'clock the swarm appeared slightly larger, and may have contained some two hundred individuals, probably seventy-five per cent. being males. Mating was observed repeatedly during swarming at a height of about six feet, although the swarm rose and fell with the passing of a slight breeze. The flight was a curious up and down vertical movement, sometimes slow and deliberate, but mostly after the fashion of the so-called 'winter-gnats'; and it was during this 'dancing flight' that the males (several) were seen to 'drop' on a female, and attempt to cling to her. The successful male held the female for some time by legs (tarsi), and bending the abdomen vertically, engaged (usually after several attempts) in copulation. The mated pair descended slowly to the ground, where the male released himself and the female oviposited. In captivity females taken in net in copulation oviposited on wet muslin, and copulated with males introduced to rearing-cage from the swarm.

Ainslie (1907) describes the swarming of *Trichocera* in commendable detail in Can. Ent., vol. 39, pp. 26-28. The writer (1923) has observed the swarming of the little known species *Molophilus flavus* Goet., *M. occultus* de Meij., and *Ormosia albitibia* Edw.

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Hazelbank, Yoker, Glasgow.

November 1925..

National Museum of Wales.—Guide to the Collections of British Lepidoptera.—Under this title the National Museum of Wales has issued, at a very moderate price, a well-printed pamphlet of 32 pages, with two excellent three-colour plates reproduced from drawings by Miss O. F. Tassart. More than forty rare and interesting specimens in the 'Vivian' and 'Griffith' collections (which together contain at least 50,000 examples of British Macro- and Micro-Lepidoptera) are figured in these plates; among them are three Noctuid moths hitherto unique as British, and not usually included in our lists, *Xylophasia lateritia* Hufn. (taken at Porthkerry, Glamorgan, about 1887), *Agrotis crassa* Hübn., and *A. spinifera* Hübn. Besides these, the very rare (as British) *Luperina dumerilii* Dup., *Cotocala electa* Bkh., *Anesychia lithospermella* Hübn., and the much-discussed 'buff variety' (*lomasaria* Cotton) of *Anphidasys betularia* L. are also well delineated. A large number of 'historic specimens' in the two collections are concisely referred to, with indications of their exact position in the cabinets; among these a '*Danaïs erippus* Cr.' (*Danaida plexippus* F.) recorded as from 'Portslade, Sussex, one Sept. 1923, a second seen' is specially noteworthy as being probably the most recent example of this wanderer that has visited our islands (cf. 'Entomologist,' Vol. LVIII, p. 97).—EDS.

Insects in the Swansea Neighbourhood.—I spent from July 31st to August 8th, 1925, in the Swansea district, and although the weather was mainly unsettled I took a few insects which may be worthy of record, though no outstanding rarities were captured.

Coleoptera were conspicuous by their absence, and only about a score were seen. The most interesting species was *Strangalia 4-fasciata* L., of which one specimen was taken on a hazel bush. *Heliopathes gibbus* F. was found singly under *Erodium* at Black Pill on the 'Burrows,' and at Oxwich Bay occurred sparingly and mainly singly *Cicindela maritima* Dj., *Saprinus maritimus* Steph., *Aegialia arenaria* F., *Anomala aenea* De G., *Sitones griseus* F., and *Phytonomus fasciculatus* Hbst.

Among the Hemiptera a few common Capsids were taken in the Clyne Valley, and at Oxwich Bay under *Erodium* and *Ononis* occurred *Therapha hyoscyami* L., *Corizus rufus* Schill., *C. parumpunctatus* Schill., *Neides tipularius* L., *Metacanthus elegans* Curt., and *Pseudophloeus falleni* Schill.

Hymenoptera were very common, as sunny intervals were rare. *Pompilus plumbeus* F. was exceedingly abundant on the sandhills at Oxwich, where also was taken a single *Oxybelus argentatus* Curt. and one example of *Tiphia femorata* F.

The only Lepidoptera of note to a north country entomologist were *Gonepteryx rhamni* and *Vanessa io*.

The greater number of my captures were among the Diptera, which were apparently more numerous than the other orders of insects. A large number of common species were in some abundance, but no great rarities turned up. Many Syrphids were taken during the fine periods. *Syrphus balteatus* DeG. was by far the most abundant species of the family. *S. corollae* F. came next in plenty, but *S. ribesii* L. was by no means as predominant as it is in the North.

Others of the family include *Eristalis horticola* DeG. (common on ragwort on Black Pill Burrows along with a small form of *Syritta pipiens* L.), *Platychirus scambus* Staeg. (very abundant on reeds on Clyne Common, and in the Clyne Valley). *Pyrophæna rosarum* F. and *granditarsa* Forst. (frequent among low herbage in marshy spots), *Syrphus bifasciatus* F., *tricinctus* Fln., and *latifasciatus* Mcq. (the last-named abundant), *Ischyrosyrphus glaucius* L. (singly), *Xylota abiens* W. (one), *Eumerus strigatus* Fln., *Chrysoclamys cuprea* Scop., and *Chrysotoxum bicinctum* L., while at Oxwich on the sandhills one *C. festivum* L. was taken.

Flies worthy of mention in other families are *Oxycera pulchella* Mg., *Odonomyia viridula* F., and *Thereva annulata* F. (at Black Pill), *Ochthera mantis* DeG. (among reeds on Clyne Common), *Pachyrrhina cornicina* L. (at Oxwich, on herbage on the sandhills; together with *Philonicus albiceps* Mg., not uncommonly but difficult to capture, one of which was carrying as prey an *Eristalis tenax* L.); and in the Clyne Valley *Tipula lateralis* Mg. and *yerburyi* Edw., *Conops flavipes* L. and *Physocephala rufipes* F. (on ragwort), *Thelaira nigripes* F., *Echinomyia fera* L. (abundant on ragwort and Umbellifers), *Erigone radicum* F., *Dexia vacua* Fln., *Loxocera albiseta* Schr. (common in marshy spots), and *Tephritis miliaria* Schr. (not uncommon on marsh thistle).—W. J. FORDHAM, Low Fell, Gateshead: December 29th, 1925.

A Day's Collecting in Hainault Forest.—One of the older records for *Euryusa optabilis* Heer (*laticollis* Heer) is from Hainault Forest. As its host, the ant *A. (D.) brunneus* no doubt once occurred there also, I thought I would go and see if it still could be found. Accordingly, having obtained the necessary permit to collect in this ancient locality, I went down on July 3rd last year. I did not find the ant as there are very few large old trees left suitable for it, and I have little doubt that it does not occur in that neighbourhood now.

There is, however, quite a large extent of forest and woodland still in existence, a great part of which consists of hornbeams. It was both interesting and curious to find so many species of beetles, usually attached to beech, oak, and other trees, had taken to the hornbeam. The following species may be mentioned which were dug out of these trees, either alive or dead:—*Clytus arietis* L., *Leptura scutellata* F., *Strangalia armata* Hbst., *Rhagium bifasciatum* F., and *Phloeotrya rufipes* Gyll. Species taken under the bark of hornbeam were *Rhinosinus viridipennis* Steph., *R. planirostris* F., *Laemophloeus ferrugineus* Steph., and *Phloeopora reptans* Grav. *Tetratoma ancora* F. and *Cis nitidus* Hbst. occurred in some abundance in a fungus on a hornbeam; and *Protinus pectinicornis* L. in and on bare trees of the same.

Sweeping long grass under trees produced *Microglossa suturalis* Sahlb., *Oxyopoda umbrata* Gyll., *Ocyusa incrassata* Muls., *Atheta cadaverina* Bris., *Stenus fuscicornis* Er., *Meligethes lumbaris* Stm., *M. picipes* Stm., *Corticaria elongata* Gyll., and *Malthodes nigellus* Kies. *Byturus sambuci* Scop. occurred in plenty on some wild raspberry bushes.—HORACE DONISTHORPE, 19 Hazlewell Road, Putney, S.W.15: January 5th, 1926.

Pamera fracticollis Schill. and other Hemiptera at Dungeness.—On September 9th last *Pamera fracticollis* was swept from *Comarum palustre* on Dungeness. This I understand is the first record from Kent. Among others, *Tropistethus holosericeus*, *Nysius thymi*, *Plinthisus brevipennis* and *Brachysteles parvicornis* were taken under low plants growing in patches on the shingle. On *Comarum palustre* was a large dark brown form of *Eurygaster maura* in both adult and nymphal stages. It may also be worth recording the capture com-

monly of the little Homopteron *Ulopa trivialis*, females greatly predominating.—C. A. W. DUFFIELD, Pickersden Brook, near Ashford, Kent : *January 5th, 1924*

Pionosomus varius Wolff at Littlestone, Kent.—While collecting at Littlestone on May 12th last Mr. H. C. F. Newton, who was with me, called my attention to a small Hemipteron which he had found running on the bare sand. On comparing this specimen with two *P. varius* kindly given to me by Mr. E. C. Bedwell its identity was at once ascertained. Hoping to take some more, a visit was made to the same spot on May 14th; at first nothing was seen of the insect, until a small patch of *Cerastium semidecandrum* was examined, when it began to occur commonly. In all, nineteen specimens were taken in quite a short time, but in every case they were attached to this small plant. On May 21st the spot was again visited, and once more the insect was found, but much less commonly than before, and the plant was beginning to die off. On June 16th the plants were quite dead, and all vegetation was dying down on the hot sand; and no mature Hemiptera were found, though small larvae were fairly plentiful in the dried-up moss. Several of these were taken, as there was every reason to suppose they were the offspring of the earlier brood of *P. varius*. The late Mr. E. A. Butler, to whom some were sent, also considered they might belong to this species, though he had not had the opportunity of coming across the early stages before. Unfortunately I was unable to bring mine through to maturity. The next visit was on October 1st, when adults were again common on the same dried-up patch of sand. On all these visits I could find no trace of the insect anywhere except on this one very small area, but on October 5th it occurred very commonly about half-a-mile from the original spot, on an equally dried-up and unpromising looking place.

This record is of interest as hitherto, I believe, Deal has been its headquarters, and it has always been found attached to *Erodium*. At Littlestone the nearest *Erodium* I could find was right out of the area in which the Hemipteron occurred. In May it was certainly attached to the *Cerastium*, but whether this was its food-plant, or merely acted as a shelter, I am unable to say. Should it be the food plant in early summer it must have another as the *Cerastium* was burnt up by the end of June at the latest, as was also the moss and in fact all vegetation.—C. A. W. DUFFIELD.

Echthromorpha intricatoria F. in New Zealand.—In February, 1922, a male specimen of this fine ichneumon-fly was captured by Selwyn Woodward, in the vicarage drive at Karori, and was shortly afterwards submitted to me for identification. I at once recognised the insect as a stranger, but seeing that only one example was available, I was unwilling to deprive the captor of his prize and decided to await the acquisition of further material. This has since come to hand, and through the kindness of Dr. Guy A. K. Marshall I am advised that the insect is *Echthromorpha intricatoria*, a species stated to be common in Australia, Tasmania and adjacent islands, but apparently not hitherto known from New Zealand. Miss Castle, of the Dominion Museum, Wellington, has since kindly looked up for me the specimens in the museum collection, and from these it would appear that Mr. Hamilton secured four examples of *E. intricatoria* at Farewell Spit, in November, 1923, and Mr. Gourlay, of the Cawthorn Institute, one in Nelson during March, 1924. On March 12th, 1925, my daughter took five male specimens, flying over nettle bushes (*Urtica ferox*), in a Karaka grove near Sinclair Head, Cook Strait, and two females were secured by myself on March 29th, in a tool shed in my garden at Karori. From these records it is clear that this ichneumon-fly is

establishing itself in New Zealand; but its arrival here is, I feel sure, of recent date, as I am satisfied that had such a handsome and conspicuous species been in any sense abundant I should have taken it even during my earliest collecting days in New Zealand (1881). I therefore think it must be assumed, in the absence of information to the contrary, that the example captured by Selwyn Woodward in February, 1922, is the first authentic New Zealand specimen. It would, I think, be very interesting if some of your Australian correspondents could supply the names of the host, or hosts, of *E. intricatoria*, as this information might be helpful in any attempt to unravel the insect's habits in New Zealand. The fact that the greatest number of specimens were found around the tree-nettle may possibly indicate that, in New Zealand, *E. intricatoria* has found a host in one of our commonest butterflies, *Pyrameis gonerilla* F.—G. V. HUDSON, Hillview, Karori, Wellington, New Zealand: October 30th, 1925.

Andrena congruens Schm. in Wiltshire.—In this Magazine, December, 1924, p. 277, I recorded *Andrena congruens* Schm. as a species new to Britain, after examination of a few faded and worn males captured by the Rev. A. Thornley and Mr. H. M. Hallett. I am now pleased to report that two fresh specimens of the female of this bee have been brought to me for determination by my friend, Mr. A. P. G. Michelmores, of Chudleigh, Devon, and Trinity College, Cambridge. These were captured in May, 1925, during his last summer term at Marlborough, in which locality he has been active in collecting insects of the more neglected orders and adding to the local lists compiled by the College Natural History Society. These English females exhibit well the characters already given by me (*l.c.*, p. 278) for this sex as shown in my Continental specimens, and confirm my original identification made from a very faded male. In the South and West of England the Andrenidae have been so decimated by a series of unfavourable seasons, with 1924 the worst of all, that I hardly expected that this species would be so soon met with again. It is interesting to note that a straight line drawn from Marlborough to Malvern would nearly pass through Cirencester, which is about equidistant from these, the three known localities being in adjoining counties. Collectors who have specimens named *dorsata* from the Midland and Northern counties should examine these to see whether they may not include some *congruens*, the ♀ of which can be separated at a glance by its practically normal hind tibiae and scopae. More nearly allied to our *dorsata* is *A. propinqua* Schm., which is abundant in many Continental localities, and it is quite possible that this or some other of the allied species which ~~are~~ described at length in Schmiedeknecht's 'Apidae Europaeae' may be discovered in this country. In my Table of British *Andrena* (Trans. Ent. Soc. Lond., 1919) the ♂ English specimens of *congruens* that I have seen would fall under the same head (p. 291) as *nigroaenea* and *gwynana*, but naturally would fail to agree with some of the characters given for either of these species; the ♀ would run (p. 296) to *ovatula* var. *fuscata*, but the dense rich brown hair on the thorax about the *scutella* and the very long and curved hairs forming an almost closed pollen-basket on either side of the propodeum—both characters of *dorsata*—will separate *congruens* at once.—R. C. L. PERKINS, Thurlstone Road, Newton Abbot: December 26th, 1925.

Distribution of Protocalliphora.—With reference to Mr. Joseph Collins' note on the above genus (E.M.M., vol. lxi, p. 259) it may be of interest to mention that *P. groenlandica* Ztt. occurs in numbers every year in the vicinity of a fish-manure manufactory situated on the banks of the Thames between Belvedere and Erith. In view of the carrion-feeding life-history of this species, I imagine

that it breeds in the evil-smelling material brought for the use of this factory. The Anthomyid *Ophyra anthrax* Mg. has, I believe, a similar life-history, and in 1921 it occurred commonly at the same place. I have not met with either species anywhere else in North Kent.—H. W. ANDREWS, Woodside, Victoria Road, Eltham, S.E.; January 1926.

Periodicals, etc., received.

(Continued from Vol. LXI, p. 188.)

British Museum (Natural History). Economic series, No. 4A, 1925. Price 6d.

'British Mosquitoes and their control,' by F. W. Edwards and S. P. James.

In Part I the 24 species recognised are characterized and their habits described, and in Part II measures for control and protection are given. The larvae of three species are figured.

National Museum of Wales, Cardiff. Eighteenth Annual Report, 1924-25.

Annals of Tropical Medicine and Parasitology, Vol. XIX, Nos. 2 and 4, July and December, 1925.

No. 2 contains two papers on entomological subjects: 'A new variety of *Anopheles marshalli* Theobald from the Belgian Congo,' by A. M. Evans; 'Some Characteristics of the First Stage Larva of *Dermatobia hominis* Gmelin,' by R. Newstead and W. H. Potts.

Dermatobia hominis is an Oestrid fly whose larva is the cause of cutaneous Myiasis in man and animals. The eggs are carried about by a mosquito, *Psorophora posticata*, a ♀ of which is shown on plate iv with a batch of them attached to the ventral surface of the abdomen.

No. 4 contains one entomological paper, entitled 'A new variety of *Anopheles marshalli* (freetownensis) from Sierra Leone,' with one plate, by A. M. Evans.

Archives de Zoologie Expérimentale. Tome 64, fasc. 1, May 1925.

This fascicule, pp. 84 and 2 plates, is devoted to a valuable paper on the 'Morphologie de l'élytre des Coléoptères adéphages,' by R. Jeannel. Chaetotaxy, tracheation of wings and elytra, etc., are described and illustrated by 65 text-figures and 2 plates, the latter showing races of *Carabomorphus catenatus* Roeschke and *C. brachycerus* Gerst.

'Eos,' *Revista española de Entomología*, Tomo I, Nos. 2, 3, June and October 1925.

No. 2 contains amongst other papers a valuable contribution by Señor A. Zulueta, entitled 'La herencia ligada al sexo en el coléoptero *Phytodecta variabilis* Ol.', with one plate, four genealogical tables (illustrating system of 'lines' and of three prevalent colours—'yellow,' 'red,' and 'black'), etc. Prof. W. Bateson, it may be noted, paid a good deal of attention to the same subject in 1895 (cf. P.Z.S. 1895, pp. 850-860, pl. 47).

No. 3 includes a paper on S. American mimetic Orthoptera by P. Vignon—'Essai de classification du genre *Typhophyllum* Serville,' illustrated by an excellent coloured plate.

Notulae Entomologicae, Vol. V, No. 3, 1925.

Contains papers by R. Frey ('Diptera Haplostomata' II, and Note on *Condylostylus beckeri* Frey [Dolichopodidae]), H. H. Karny (on *Phloeothrips sanguinolentus* Bergroth, etc.), and R. Forsius (on Corporaal's Tenthredinoidea of Sumatra).

Catalogue of Indian Insects (Calcutta: Government of India Central Pub-

Part 6: 'Staphylinidae,' by Malcolm Cameron.

Part 9: 'Zygaenidae,' by T. Bainbrigge Fletcher.

Both issued in 1925. The former include over 1,100 species, probably representing (according to the compiler) about one-tenth of the number existing there; the latter number 225 species recorded up to date.

Agricultural Research Institute, Pusa, Scientific Report for 1924-25 and Bulletin No. 161, 1925.

The latter gives a list of publications on Indian Entomology, 1924 (compiled by the Imperial Entomologist).

Memoirs of the Department of Agriculture in India, Entomological Series, Vol. VIII, Nos. 10-12, Vol. IX, Nos. 1-3, April and June 1925.

Vol. VIII, No. 10: 'Papers on Indian Tabanidae,' illustrated by 5 plates, by P. V. Isaac: IV, 'The Head and Mouth-parts of the larva of *Tabanus rubidus* Wesm. (= *albimediatus* Wlk.).' V, 'The Mechanism of suction in the larva of *Tabanus tenens* Wlk.' VI, The male and female genitalia of *Tabanus tenens* Wlk. VII, Notes on the Life-history of *Tabanus striatus* Fabr. (= *hilaris* Wlk.).

No. 11: 'Some Indian species of the Dipterous genus *Atherigona* Rondani,' illustrated by 2 plates, by J. R. Malloch.

No. 12: 'The Nim Mealy scale (*Pulvinaria maxima* Green),' illustrated by 5 plates, by T. V. R. Ayyar.

Vol. IX, No. 1: A contribution towards a Monograph of the Indian Coniopterygidae (Neuroptera), illustrated by 4 plates, by Dr. C. L. Withycombe. Twenty new species are described and structural details of others figured.

No. 2: 'Papers on Indian Tabanidae': VIII, The Bionomics and Life-histories of some of the common Tabanidae of Pusa, by P. V. Isaac, illustrated by 6 plates.

No. 3: Some observations on the Life-history and Habits of *Phycus brunneus* Wied. (Family Therevidae), by P. V. Isaac, with one plate.

Agricultural Journal of India, Vol. XX, 1925.

Part 5 of this volume includes an entomological paper entitled 'The South Andaman coconut-slug-caterpillar (*Thosea unifascia* Walk.),' by P. V. Isaac. This is the larva of a Limacodid moth which has now become a pest at Port Blair. The various stages of the insect are figured and also the two sexes of the Braconid parasite.

Union of South Africa Department of Agriculture. Entom. Memoirs, Nos. 2, 3, 1924, 1925.

The entomological papers in No. 2 are as follows: 1, 'Fruit flies of wild olives,' by H. K. Munro; 2, 'South African Psyllids,' by F. W. Pettay; 3, 'The Thorax and Abdomen of winged Termites,' by C. Fuller; 'White ant experiments,' by C. Fuller. The one in No. 3: 'Biological Notes on S.A. Trypanidae (fruit-flies),' I, by H. K. Munro.

Entomological Notes, Series 5, 7, 9, 10, 11, 12, Reprints, 1924, 1925.

Report of the Division of Entomology for year ending 30th June, 1924, Reprint 1925, by C. Lounsbury.

U.S. Department of Agriculture. Dept. Bulletins, May and September, 1925.

No. 1,328: 'The flight activities of the honeybee,' by A. E. Lundie.

No. 1,336: 'Biological studies of the green clover worm (*Plathypena scabra* Fabr.),' by C. C. Hill.

A Hyphenid moth attacking various clovers, etc., which has numerous natural enemies, 14 amongst the Hymenoptera and 14 amongst the Diptera.

No. 1,339: 'The effect of weather upon the change in weight of a colony of bees during the honey flow,' by J. I. Hambleton.

No. 1,349 : 'The brood-rearing cycle of the honeybee,' by W. J. Nolan.

U.S. Department of Agriculture. Miscellaneous circular, No. 46, September 1925.

'A Biography of the European corn borer (*Pyrausta nubilalis* Hbn.),' by J. S. Wade.

Review.

'CAMOUFLAGE IN NATURE.' By W. P. PYCRAFT, F.Z.S. Pp. xiv and 280, with 4 coloured plates and 60 other illustrations. London : Hutchinson and Co. Price 21/- net.

The author of this volume, whose 'Courtship of Animals,' 'Infancy of Animals,' etc., are known to many lovers of Natural History, has compiled a large amount of interesting information on the coloration, mimicry, etc., amongst both Vertebrates and Invertebrates, which, if not new to us, is nevertheless useful to have in collected form. As he says in the preface, the aim of the work is to present the essential features of the coloration of animals and the various interpretations for that coloration which have been advanced by the sportsman-naturalist as well as by men of science, such features being in great part needed for 'camouflage,' though this is by no means the only factor. As he truly says, we must not overlook the fact that we have in our own country an abundant source of material for the study of this most fascinating theme, and that there is no need to turn to the tropics for examples of protective and warning-coloration, mimicry, and secondary sexual-coloration. The factors which determine colour are the same, whether we study them at home or abroad. The Vertebrates, as might be expected from the author's knowledge of them, afford most of the examples described. The Invertebrates are dealt with in less detail, but the entomologist will find much to interest him : Chapter I, Introductory, defines 'camouflage' and its meaning ; VII, VIII, IX, concerns 'Protective coloration' ; X, 'Mimicry' ; XI, 'Warning coloration' ; XII, 'Coloration of young animals' (including eggs and caterpillars) ; XIV, 'Sexual selection.' The insects mentioned belong to the Lepidoptera, Orthoptera, Hemiptera, Hymenoptera, and Diptera, illustrated on ten plates, some of which have been reproduced by permission and others photographed for the author. The book is extremely well printed and illustrated, very few misprints (such as *Porthesia auriflora*, p. 173) having escaped the notice of the editor.

Obituary.

Abbé J. J. Kieffer.—We regret to learn that this distinguished French entomologist died unexpectedly on the 30th of December last, in his 69th year. While engaged for many years on the teaching staff of the Saint-Augustin College at Bitche (Lorraine), he devoted most of his energies to research. He took a wide interest in the natural history of his district, his published papers (from 1886 onwards) on the fauna and flora of Lorraine covering original observations on plants, birds, and insects of several orders. In addition, he accomplished a stupendous amount of work in describing collections of Hymenoptera and Diptera which were sent to him. We cannot but admire the courage with which he set himself to work at just those groups which had long been neglected on account of the great difficulties attending their study. Commencing with the gall-making Diptera and Hymenoptera, he later turned his attention to other families of these orders, and produced a series of important monographs in the 'Genera Insectorum' and 'Das Tierreich.' His catalogue of the Cecidomyiidae in the first-named publication is the standard work of reference on this family, and in spite of faults must long remain so. While monographing the

Cecidomyiidae he also began, in 1901, to turn his attention to the still more neglected Chironomidae, and for the last few years of his life he devoted himself almost entirely to this family, producing a series of over two hundred papers on the midges of the world. While we may dislike the uncritical way in which he poured forth a continual flood of descriptions of new species, usually without reference to previously known forms, and the excessive number of genera introduced on the most trifling basis; yet he certainly deserves great credit for having discovered very many microscopic details of structure which are of great value in classification, and which but for him might have remained unknown. He has left the systematics of Chironomidae in confusion, but he has pointed the way out. As a correspondent he appeared to lack geniality and certainly resented any criticism. But by holding rigidly to his own way he has accomplished a memorable work.—F.W.E.

Ernst Evald Bergroth, M.D.—The announcement of the death of this eminent Hemipterist on November 22nd, 1925, has been received. A full notice of his life and work will appear in the next number of this Magazine.

Societies

YORKSHIRE NATURALISTS' UNION. Entomological Section.

The annual meeting was held at the Leeds Philosophical Society's Museum on Saturday, October 17th. The attendance was smaller than in previous years, and the exhibits in some of the Orders suffered in consequence.

The President, Mr. G. T. Porritt, F.L.S., F.E.S., occupied the Chair at the afternoon meeting, which was mainly devoted to an examination of specimens illustrating the year's work. The most notable were as follows:—

COLEOPTERA. By Mr. J. M. Brown, F.L.S.: *Lebia chlorocephala* Hoffm., Sandsend, near Whitby; *Hedobia imperialis* L., Askham Bog; *Platycis minutus* F., Sandsend; **Orchestes foliorum* Müll., Middleton-in-Teesdale. By Mr. J. R. Dibb, †*Bruchus* sp.; *Monochamus sartor* L.; †*Pentarthrum huttoni* Woll., all from Leeds. By Mr. E. G. Bayford, F.E.S.: *Dryophthorus corticis* Payk., recently added to the British list by Mr. Donisthorpe from specimens taken at Windsor. By Mr. M. L. Thompson, F.E.S.: †*Quedius fulvicollis* Steph., Cronkley Fell; **Philonthus micans* Grav., Askham; *Choleva longula* Kell., Glaisdale; **Anisosticta 19-punctata* L., Askham Bog; **Tetropium gabrieli* Weise v. *crawshayi* Shp., Middlesbrough; †*Galerucella lineola* F., Askham Bog.

LEPIDOPTERA. By Mr. G. T. Porritt: Specimens of *Orgyia antiqua* v. *confinis* from Royd Edge Moors, Huddersfield; *Lycaena icarus*, from Tyrone, the specimens as large as *L. corydon*, and the females brilliant blue, with the red spots large and extending through the margins of both fore and hind wings; and melanic form of *Boarmia roboraria* from the Epping district. By Mr. B. Morley: A series of *Bombyx callunae* vars. bred from black larvae, from Penistone Moors; the males being darker brown than ordinary, and the females dull brown with no yellow scales. A specimen of *Smerinthus tiliæ* from Taunton and another from North Kent, both with black underwings and a one-spot var. from the last-named locality. Large specimens of *Xanthia aurago* from Deffer Wood, near Huddersfield. A specimen of *Orthotaenia anti-quana* from Cawthorne: this species has been recorded previously from two localities only in Yorkshire, one being in the North and the other the West Riding. *Hedya lariciana* Zell. and *Sciaphila hybridana* Hübn., new to the Skelmanthorpe district, and a melanic specimen of *Acronycta psi* L. from the same

* Indicates new records for a Riding.

† A first record for the County.

locality. By Mr. C. A. Cheetham, F.E.S. : A specimen of *Zeuzera aesculi*, from Farnley, near Leeds. By Mr. T. A. Lofthouse, F.E.S. : *Eupithecia venosata* from Middleham, *Eupoecilia nana* from Askham Bog, York, etc.

TRICHOPTERA. The President exhibited specimens of *Mystrophora intermedia* Klap. recently added to the British list from examples taken at Coniston by Mr. K. J. Morton, F.E.S.

HEMIPTERA. By Mr. J. M. Brown : Species of *Calocoris* including *striatus*, *ochromelas*, *infusus*, *sex-guttatus*, and *alpestris*, *Dichrooscytus rufipennis*, *Piezodorus lituratus*, *Zicrona coerulea*, †*Aphanus subapterus*, †*Corixa carinata*, †*Eupteryx germari*, *Trioza galii*.

HOMOPTERA. Mr. J. M. Brown : Specimens and drawings of the scale-insects *Orythesia cataphracta* and *Newsteadia floccosa*.

COLLEMBOLA. By Mr. J. M. Brown : Specimens and drawings of a recently described species, †*Orchesella littoralis*, taken at Runswick Bay.

HYMENOPTERA. By Mr. C. A. Cheetham, F.E.S. : *Ammophila sabulosa*, from Allerthorp Common, near Leeds.

DIPTERA. By Mr. C. A. Cheetham, from various parts of the county : *Chironomus tarsalis* Wlk., *Anopheles plumbeus* Stph., *Finlaya geniculata* Ol., *Idioptera fasciata* L., *Tipula fascipennis* Mg., *Tipula irrorata* Mcq., *Oxycera trilineata* F., *Beris morrisii* Dale, *Tabanus cordiger* W., *Lasiopogon cinctus* F., *Dioctria baumhaueri* Mg., *Atherix ibis* F., *Thereva annulata* F., *Acrocera globulus* Pz., *Empis vitripennis* Mg., *Euthyneura gyllenhali* Ztt., *Chelipoda melanocephala* F., *Sciodyromia immaculata* Hal., *Platypeza consobrina* Ztt., *Psilopus contristans* W., *Dolichopus simplex* Mg., *Hypophyllus discipes* Ahr., *Eristalis sepulchralis* L., *Chrysotoxum cautum* Harr., *Chrysotoxum bicinctum* L., *Conops flavipes* L., *Sicus ferrugineus* L., *Zodion cinereum* F., *Loxocera sylvatica* Mg., *Tephritis absinthii* F.

By Mr. W. D. Hincks : A number of specimens of common species of the genus *Chironomus* Mg. including *venustus* Staeg., *longistylus* Goet., *plumosus* L. v. *grandis* Mg., *chloris* Mg., *nigrimanus* Staeg., *dorsalis* Mg., *tentans* F., *viridanus* Ruthe, *pedestris* Mg., *pedellus* De G., *plumosus* L., v. *ferrugineovittatus* Zett.

By Mr. E. G. Bayford, from the Barnsley district : *Chrysops relictus* Mg., *Sciara caudata* Wlkr. (*longiventris* Zett.), *Aphiochaeta projecta* Beck., †*Pezomyia vanderwulpi* Edw., new to Great Britain.

The evening meeting was presided over by Mr. C. A. Cheetham, and was devoted to the election of officers, etc., of the section and its various Committees. The President, Mr. G. T. Porritt, was re-elected unanimously, as were also the Secretaries, Messrs. W. D. Hincks and T. B. Kitchen. The reports on the various Orders were submitted by their respective Secretaries, and bore testimony to the favourable character of the past season. The most important species met with had for the most part been exhibited in the afternoon. From a numerical point of view the students of Diptera had procured material for an excellent report, some thirty odd species being new to the county, including species new to the British List. A field meeting at Allerthorp Common was decided to be held in May or June, 1926.—E. G. BAYFORD.

ENTOMOLOGICAL SOCIETY OF LONDON : Wednesday, October 7th, 1925—Professor E. B. POULTON, F.R.S., President, in the Chair.

The following were elected Fellows of the Society :—Mr. M. P. Latter, F.G.S., Weak Place, Sevenoaks, Kent, and Mr. F. R. D. Onslow, B.A., 10 Keswick Road, East Putney, S.W.

The Treasurer drew attention to four new portraits which had been hung on

the walls of the meeting room, one, among them, being that of Mr. J. G. Children, the first President of the Society.

Mr. M. Donisthorpe exhibited examples of no fewer than six beetles new to Britain. The President, among other exhibits, showed some interesting new races of *Papilio* from South-west Abyssinia and Somaliland, and some interesting Tettigoniids from Costa Rica. Dr. F. A. Dixey, F.R.S., exhibited lantern slides showing the development of scent-scales in *Pieris rapae*. Mr. A. Dicksee, a gynandromorph of *Papilio androgeus* and a pair of the rare *Morpho uraneis*. Mr. H. M. Edelsten, a banded variety of *Chiasmia clathrata* from the Cambridgeshire Fens. Mr. W. J. Kaye gave an account of his paper on the butterflies of Jamaica and exhibited specimens of characteristic species which occur on that island.

Wednesday, October 21st, 1925—Professor E. B. POULTON, F.R.S., President, in the Chair.

The following were elected Fellows of the Society :—Dr. A. J. Hesse, South African Museum, Cape Town; Rev. J. R. J. Llewellyn Jones, M.A., Newcote, West Avenue, Exeter, and Mr. A. Robinson, B.A., Bretavely, Seal, near Sevenoaks, Kent.

Dr. E. A. Cockayne exhibited Pierine larvae and discussed the development of the prothoracic gland in them. Mr. P. P. Graves, a number of butterflies from Corea. The President, among other exhibits, showed a female larva of *Drilus flavescens* and discussed the influence of certain Micro-Lepidopterous larvae in preserving the tissue of autumnal leaves so that it remains green and is free from attack by other larvae. Mr. F. W. Edwards exhibited a rare Termitophilous fly from India. Lord Rothschild, F.R.S., two sub-species of *Papilio androgeus*.

The following papers were read :—‘On the Butterflies of Jamaica,’ by Mr. W. J. Kaye; ‘On a remarkable new Dragonfly from Samoa,’ by Major F. C. Fraser; ‘On a new Psychid,’ by Mr. F. M. Jones; ‘Contribution a la Faune des Orthoptères des Nouvelles-Hebrides, avec une introduction de John R. Baker,’ by C. Williams (communicated by Professor E. B. Poulton, F.R.S.).

Wednesday, November 4th, 1925—Professor E. B. POULTON, F.R.S., President, in the Chair.

The following were elected Fellows of the Society :—Dr. G. V. Bull, B.A., M.B., Montague House, Hoddesdon, Herts.; Rev. J. G. Digges, M.A., Gloomcahir, Mohill, Co. Leitrim; W. Fassnidge, M.A., 47 Tennyson Road, Southampton; Alfredo Faz, 714 Calle Bandera, Santiago, Chile; F. G. Holdaway, Zoological Dept., The University, Adelaide, South Australia; Hamid Salim Soliman, Ministry of Agriculture, Cairo, Egypt; Mohammed Soliman el Zoheivy, Ministry of Agriculture, Cairo; Rt. Rev. the Lord Bishop of Edmundsbury and Ipswich, The Bishop’s House, Ipswich; R. Winckworth, 37 Upper Rock Gardens, Brighton; Commdr. G. C. Woodward, Training Ship ‘Cornwall,’ Purfleet, Essex.

Mr. N. D. Riley exhibited a selection of the butterflies taken by the members of the Scientific Expeditionary Research Association during the voyage of the ‘St. George,’ including a new species of *Libythea* from the Marquesas, and Mr. C. L. Collenette gave a brief account of the circumstances of their capture. Mr. J. E. Collin exhibited and made remarks upon a Tachinid fly, *Exorista confinis*, bred from the larva of the last brood of the ‘Holly Blue,’ *Cyaniris argiolus*. The President exhibited a specimen of *Erebia aethiops* from Switzerland bearing the marks of a bird’s beak, and also, on behalf of Mr. H. M. Pendlebury, a Siamese Ichneumonid probably mimetic of a fossorial wasp. Mr.

W. J. Kaye exhibited a series of *Aeria agna* and *Heliconius charithonia* from Venezuela.

Wednesday, November 18th, 1925—Professor E. B. POULTON, F.R.S., President, in the Chair.

The Secretary announced that the Council had nominated the following as Officers and Council for 1926-27 :—*President* : Professor E. B. Poulton, M.A., D.Sc., F.R.S. *Treasurer* : W. G. Sheldon, F.Z.S. *Secretaries* : S. A. Neave, M.A., D.Sc., F.Z.S., and N. D. Riley, F.Z.S. *Librarian* : H. J. Turner. *Council* : W. A. F. Balfour-Brown, M.A., F.Z.S.; Professor W. Bateson, M.A., F.R.S.; G. C. Champion, F.Z.S., A.L.S.; E. A. Cockayne, M.A., M.D., F.R.C.P.; H. M. Edelsten; H. Eltringham, M.A., D.Sc., F.Z.S.; J. C. F. Fryer, M.A.; Professor T. Hudson Beare, B.Sc., F.R.S.E; K. Jordan, Ph.D.; G. A. K. Marshall, C.M.G., D.Sc., F.R.S.; W. Rait-Smith; H. Scott, M.A., Sc.D.

The following were elected Fellows of the Society :—F. J. Killington, A.C.P., 1 St. Catherine's Road, Eastleigh, Hants; E. P. Musford, Christ's College, Cambridge; A. J. A. Woodcock, M.Sc., Clifton Manor, York.

The President announced that, beginning with the coming year, the Council had decided to increase the size of the Transactions to Super Royal 8vo, with a printed page measuring $4\frac{1}{2}$ by $7\frac{1}{2}$ ins.

Mr. L. W. Newman, on behalf of Mr. P. M. Bright, exhibited aberrations of British Lepidoptera from the Oberthür collection. The President exhibited a number of insects from a small island of the Sese Archipelago, Victoria Nyanza.

Mr. G. T. Gimingham showed lantern slides illustrating his paper, and the President also exhibited lantern slides to illustrate Mrs. Brindley's paper and an appendix to it by himself.

The following papers were read :—'New Species of Staphylinidae from India, Part III,' by Dr. M. Cameron; 'The Venation of the Hepialidae,' by Mr. A. Philpott; 'Diptera from the Island of Rodriguez,' by Professor Bezzi and Dr. C. G. Lamb; 'Defensive Colour and Pattern in four Caterpillars from British Guiana,' by Mrs. M. H. Brindley (communicated by the President); 'On the Presence of an Egg-burster in Aphididae,' by Mr. G. T. Gimingham.

Wednesday, December 2nd, 1925—Professor W. BATESON, F.R.S., Vice-President, in the Chair.

The Secretary read for the second time the nominations for Officers and Council for 1926-27.

The President announced the death of Mr. E. A. Butler, B.A., B.Sc.

The following were elected Fellows of the Society :—R. B. Benson, B.A., St. Catherine's College, Cambridge; H. G. H. Kearns, B.Sc., Downing College, Cambridge; Miss C. Longfield, 20 Pont Street, London, S.W.1.

Dr. G. V. Bull exhibited aberrations and varieties of British Lepidoptera. Miss L. E. Cheesman, the nymphs of a Coreid bug* from Panama, with a sketch showing their habit of collecting in clusters so as to resemble a spike of brightly coloured flowers. Mr. N. H. Joy, an example of *Bembidion redtenbacheri* K. Daniel, new to Britain. Dr. A. D. Imms, who illustrated his remarks with lantern slides, gave an interesting account of an entomological visit to the Hawaiian Islands.

The following papers were read :—'Parthenogenesis of *Methoca ichneumonoides* Latr. (Hymenoptera, Vespoidea),' by Mr. H. T. Pagden (communicated by Dr. H. Scott); 'On Walker's types of Plume Moths in the National Collection: Re-distribution and Notes,' by Mr. T. Bainbrigge Fletcher.—S. A. NEAVE, Hon. Sec.

* Since identified as *Pachylus hector* Stål.

EUPLECTUS AFER REITTER VAR. *INFIRMUS* RAFFRAY, A COLEOPTERON
NEW TO BRITAIN.

BY HORACE DONISTHORPE, F.Z.S., F.E.S., ETC.

Last year I took two specimens of a small *Euplectus* which I was unable to name. It seemed to come near both *E. signatus* Reich. and *E. karsteni* Reich., but did not agree with either species. Eventually I sent them to my friend, Colonel Sainte-Claire Deville, who recently returned them, informing me that they are *E. afer* Reitt. var. *infirmus* Raffr. The description of this variety is to be found in Raffray's revision of the Palaearctic species of *Euplectus* [Ann. Soc. Ent. France, 79, 225 (1910)]. *E. afer* comes into Reitter's subgenus *Diplectellus*, in which two small punctures are present between the scutellary and dorsal striae at the base of the elytra, the three punctures on the thorax being joined together by a distinct transverse furrow. *E. afer* Reitt. is recorded from Algeria, Morocco, Spain and Algenciras, and has not of course been found in Britain. The var. *infirmus* Raffr. occurs in Spain, Algenciras, Basses-Pyrenees, Mentone, Tuscany, Macedonia, etc. Deville has taken it under bark of oaks in the Forests of Fontainebleau and Sénars. It is smaller than the typical form, lighter in colour and a little more pubescent. The head is generally fairly strongly punctured, sometimes less so at the sides, smooth in the middle. The furrows on the head are more obsolete, the frontal impression being less profound. The elytra longer than broad; the dorsal striae a little shorter, and not passing the anterior third. The striae of the two first tergites are relatively fairly long, and reach a little beyond the middle, but they are very fine and it is sometimes difficult to appreciate their exact length. Length: 1.20—1.30 mm.

I took my two specimens, the first on June 25th and the second on June 29th, in wood mould from nests of *A. (D.) brunneus* in oak trees in Windsor Forest. A number of species of *Euplectus* have been found with ants, but I do not think any of them are regular myrmecophiles.

19 Hazlewell Road, Putney, S.W.

February 16th, 1926.

PHYLLODREPA PUBERULA BERNH., A STAPHYLINID BEETLE NEW
TO THE BRITISH LIST.

BY JAMES H. KEYS, F.E.S.

Phyllodrepa puberula Bernh. is closely allied to *P. floralis* Payk., but is slightly smaller and differs from that species in having the upper surface of the body distinctly pubescent; the

thorax slightly narrower, with scarcely a trace of sinuation before the posterior angles, and its margins narrowly ferruginous; the abdomen has its ground sculpture stronger, and puncturation more asperate than in *floralis*; antennae entirely red. I took one specimen from ivy bloom, Stoke Bay, near Plymouth, in October, 1921, and one specimen was taken by Mr. H. St. J. K. Donisthorpe, by sweeping, at Freckenham, 13th May, 1925. Probably the insect will be found in collections mixed with *P. floralis*.

I am indebted to Colonel J. Sainte-Claire Deville for suggesting to me that this beetle would be likely to occur in Britain, and I also wish to thank him for kindly confirming the identity of the above-mentioned two specimens.

7 Whimble Street, Plymouth.

February 16th, 1926.

TWO UNDESCRIBED SPECIES OF ACTINOPTERYX FROM BAUDIN ISLAND, N.W. AUSTRALIA.

BY H. BRITTEN, F.E.S.

When examining the series of *Actinopteryx australis* Matth., in the British Museum collection, the following very distinct species were met with, both of which had been determined as *A. australis* Matth. by Isaac B. Ericson. The above-named insect inhabits New Zealand, and is quite different in sculpture. Specimens of each of these new forms were sent many years ago to Mr. Champion by the late T. Blackburn, of Adelaide, but without definite Australian locality attached.

Actinopteryx reflexa n. sp.

Oblong oval, depressed, densely covered with pale pubescence; head large, black, very finely reticulate, shining; antennae long, pitchy-testaceous; thorax black, shining, with angles rufous, large, more than twice as broad as long, widest at base, with hind angles strongly produced, sinuate on outer margin towards apex, with point slightly turned outwards, surface very finely reticulate; elytra obscurely rufescent, much longer than head and thorax, with stronger reticulations, duller, strongly narrowed towards apex, apices separately rounded; legs dark testaceous, with femora inclined to pitchy; underside uniformly black.

Length 0.95-0.98 mm.

The large size, broad thorax, with angles strongly produced and slightly curved outwards, shining appearance, black head, thorax, and scutellum, with bright-rufous angles to the thorax, and the obscurely rufescent elytra, which are strongly narrowed towards apex, makes this species easy of recognition.

Two specimens mounted on one card in the British Museum, labelled 'Baudin I., W. Australia, J. J. Walker'; five others in Mr. Champion's collection.

Actinopteryx parallela n. sp.

Elongate, parallel-sided, thorax and elytra separately rounded, pitchy-black, shining, depressed, with pale pubescence; head large, black, shining, almost invisibly reticulate; antennae long, testaceous, slightly infusate, especially in apical joints; thorax pitchy-black, with side-margins and hind angles rufous, evenly rounded at sides, widest in middle, slightly constricted before apex of hind angles, with apex produced, shining, with reticulation almost invisible; elytra pitchy-black or pitchy-red, not quite twice longer than head and thorax, evenly rounded at sides from base to apex, widest about middle, surface rather strongly asperate, covered with pale pubescence; legs testaceous, with femora slightly infusate in middle; underside pitchy-black, with mouth-parts, coxae, and apex of abdomen testaceous.

Length 0.82 mm.

The shape of this species is very distinctive. The separately-rounded sides of the thorax and the elytra, with the latter widest about middle, gives it a parallel-sided appearance, a character differentiating it from the other members of the genus, including *A. acuminata* and *A. rufescens* Britt., from the Seychelles.

Three examples, mounted on one card, in British Museum, labelled 'Baudin I., W. Australia, J. J. Walker'; one other in Mr. Champion's collection.

Manchester Museum,

January 18th, 1926.

PTENIDIUM NIGRIFRONS N. SP. FROM THE SCILLY ISLANDS.

BY H. BRITTEN, F.E.S.

Early in March last year Mr. K. G. Blair sent me a few examples of Trichopterygidae taken in the Scilly Isles for determination; amongst these was a species of *Ptenidium* which apparently has not been previously described.

Ptenidium nigrifrons n. sp.

Head and thorax black, shining, thinly clothed with moderately long white hairs, almost without visible sculpture; scutellum with central keel and two deep punctures placed just within side-angles, two small punctures in centre of disc from each of which springs a long white hair; elytra castaneous-brown, with thinly scattered and moderately long white hairs, puncturation almost invisible; antennae yellow at base, darkened towards apex; legs yellow; metasternum smooth and shining.

Length 0.96 mm.

This species falls under the same section of Fowler's Table, Col. Brit. Islands, Vol. VI, p. 101, as *P. myrmecophilum* Motsch., but is readily recognised by its smooth and shining appearance, with much longer hairs.

Three specimens, found in a rotten cabbage-stalk at St. Mary's, Scilly Is., December 1922, by Mr. W. N. Blair. The type has been placed in the British Museum.

Manchester Museum,

January 20th, 1926.

ON SOME NEW AND LITTLE-KNOWN BRITISH *CICADINA*, WITH A
TABLE OF THE GENUS *EUPTERYX*.

BY JAMES EDWARDS, F.E.S.

Aphrophora myricae n. sp.

Easily distinguished from its British congeners by its much larger size, brown appearance, and the obtusangular front edge of the crown; the length of the latter down the middle being one-third greater than it is next the eyes; length of the crown-plate down the middle less than half of its hinder edge. Upper-side grey-brown punctured with black; elytra with a narrow band of suffused blackish spots from the half-length of the costa towards the scutellar angle and usually ending on A₂ just before its apex; beyond this band dusky with darker veins; on M, at a point opposite the apex of A₁, a small suffused whitish spot. The development of the dark band is variable, but the pale spot on M is very persistent. Male genital plates obliquely truncate at the apex, the angles rounded off.

Length 11-13 mm.

Horning, Hoveton, Norfolk; 18, viii, 14, x, 1925; both sexes on the latter date. On taking this species at Horning I formed the opinion that it was associated with *Myrica gale*, and this is confirmed by Mr. Thouless, who took at Hoveton the majority of the nineteen male and fifteen female examples which I have examined.

Our species of this genus may be distinguished as follows:—

- 1 (2) Elytra with a white ante-median band from the costa halfway to the scutellar angle. On various trees and shrubs, including Scots pine.
..... *alni* Fall.
- 2 (1) Elytra otherwise.
- 3 (4) Upper-side greenish-yellow punctured with black. On *Salix fragilis*.
..... *salicis* de G.
- 4 (3) Upper-side otherwise.
- 5 (6) Basal third of the costa widely greenish-yellow. Crown down the middle twice as long as it is next the eyes. *maculata* J. Edw.
- 6 (5) Basal third of the costa concolorous grey-brown. Crown down the middle one-third longer than it is next the eyes. *myricae* J. Edw.

A. alni, notwithstanding its specific name, adapts itself to a variety of food-plants; at Colesborne I find it living on *Pinus sylvestris* in company with *Philaenus campestris*, *Grypotes*, etc. There can be no reasonable doubt that *A. salicis*, *A. maculata* and *A. myricae* had a common ancestor, but to-day they are quite distinct in appearance and habitat.

Idiocerus viduatus J. Edw.

As the result of a better acquaintance with the range of variation in *Idiocerus elegans*, I am satisfied that the name *viduatus* was given by me to a female example of the former in which the inner edge of the pale band on the elytra is abnormally oblique. This was also the view taken by Oshanin (Ann. Mus. Zool. Acad.

Imp. St. Petersburg, xii, p. 224, 1907), who found the female only between Shuvaloff and Udalno in the Government of St. Petersburg, 10. ix. 1895. In August, 1923, I took a second example of *I. viduatus*, also a female, on *Salix cinerea*, in a marsh at Ranworth, Norfolk. In August, 1925, I particularly worked the same plant on similar terrain at Horning, and amongst a series of *I. elegans* I got two or three females which, considered per se, should be called *I. viduatus*; but I could obtain no male other than that of *I. elegans*.

Eupteryx thoulessi n. sp.

Similar in size and general appearance to *E. melissae* but easily distinguished by the slightly arcuate row of four black dots across the base of the frons. Aedeagus with the stem evenly curved and dorsally compressed; appendages two, each divided from the base into two very dissimilar branches, one erect, elongate-triangular, the other about twice as long, sub-terete, acuminate, curving obliquely outward and downward.

Taken by Mr. Thouless, 12-26, ix, 1925, from *Mentha*, in an alder-swamp adjoining the river Bure at Hoveton, Norfolk, in the course of his unsuccessful endeavours to procure for me additional examples of the next species.

Eupteryx simplex n. sp.

Very similar to the form of *E. urticae* having the hind tibiae pale. Appendages of the aedeagus two, unbranched, strap-shaped, acuminate, erecto-patent spreading obliquely cephalad.

I swept one teneral male of this species, 23, viii, 1925, in a marsh south of the road leading from Hoveton St. John to Horning, a short distance east of the point where the road crosses a ditch running north-east from Hoveton Little Broad; it probably came from *Stachys palustris*.

Eupteryx britteni J. Edw.

In the original description this species is said to be like *E. urticae* in all except the aedeagus. From a study of ample material it now appears that the single oblong black marking at the base of the frons is a constant feature in *E. britteni* correlated to the peculiar form of the aedeagus, the free lateral black spot on the pronotum, and the fuscous, rather than black, darkening of part of the hind tibiae, and not merely an abnormal coalescence of the black points such as may be observed, rarely, in *E. urticae*. At Colesborne, on 11, x, 1925, in one gathering from nettles which had flowered, I got twenty-two *E. urticae* of both sexes, all normal, and one *E. britteni* male; and in one gathering from a patch of nettles which had not reached the flowering stage, and of which the foliage was consequently more dense, I got one male and ten

female normal *E. urticae*, one female ab. *leucocnema*, and nine males and nine females of *E. britteni*. It appears not unlikely that the two species are always associated.

The genus *Eupteryx*, as in current use, is distinguished from all other Typhlocybina (*i.e.* Cicadina having the frontal sutures not meeting above the antennae; the ocelli usually absent or, if present, on the forehead; M not forked on the disk of the elytra; and both edges of the outer face of the hind tibiae multi-spinose) by the venation of the wings. The latter has often been figured and variously described; according to the Comstock-Needham system its real state is as follows: The principal vein next the costa is R; it forks near the half-length and $R_2 + 3$ runs as a feeble spur to the coupling-tongue; $R_4 + 5$ is continued almost to the termen and is connected with M by the cross-vein r-m. The next principal vein is M, which is simple, ends at the termen and is connected with the vein next below it by the cross-vein m-cu. The next principal vein is Cu 1, Cu 2 being the vein which lies between it and the anal furrow; Cu 1 is unequally forked, Cu 1a ends at the termen and the weak Cu 1b runs somewhat obliquely outward to join the ambient vein. A₁ and A₂ lie between the anal furrow and the anal hinge-line and coalesce in their basal half, A₃ is on the anal flap. The ambient vein starts at the anal hinge-line, receives a₂, a₁, Cu 2 and Cu 1b and runs to the termen at some distance below the apex of Cu 1a.

The following is a table of our British species:—

- 1 (30) Head across the eyes not narrower than the pronotum.
- 2 (5) Pronotum uniform blackish-brown usually with an arcuate row of three or five minute yellowish spots in front.
- 3 (4) Length 3 mm. *vittatus* L.
- 4 (3) Length 2·2'3 mm. *notatus* Curt.
- 5 (2) Pronotum otherwise.
- 6 (19) Disc of pronotum occupied by a brown patch which is narrowed in front, reaches the hind margin, and is sometimes divided down the middle by a strip of the pale ground-colour.
- 7 (12) Pronotum with a large patch of the pale ground-colour on each side of the front half not entirely circumscribed by the dark markings; the lateral black spots not transverse. Elytra with cross-vein distal m-cu distinct.
- 8 (11) Frons with a pair of black points at the base.
- 9 (10) Hind tibiae in greater part black. Lateral black spots on the pronotum reniform, reaching the hinder angle. Appendages of aedeagus two, forked, directed obliquely downward, the two branches straight, the upper short and a little in advance of the plane of the stem, the lower twice as long and half as stout. *urticae* L.
- 10 (9) Hind tibiae pale. Lateral black spots on the pronotum neither reniform nor reaching the hinder angle. Appendages of aedeagus two,

- unbranched, sub-erect, strap-shaped-acuminate, curving outward obliquely cephalad. *simplex* J. Edw.
- 11 (8) Frons with an oblong or sub-quadrate black spot at the base. Lateral black spots on the pronotum roundish or irregular, free from the hinder angle. Appendages of aedeagus two, curved, directed obliquely outward, backward and downward, each bearing on the basal half of the outer edge 2-4 small oblique spines pointing towards the apex, the one or two nearest the base the smaller. *britteni* J. Edw.
- 12 (7) Pronotum on each side of the front half with a large roundish patch of the pale ground-colour bounded outwardly and in front by an irregular black line and inwardly and behind by the edge of the brown patch; the lateral black spots transverse. *Cu 1a* in elytra anastomosing with *M*. *stachydearum* Hardy.
- 13 (14) The fuscous patch near the middle of cell *Cu 2* not dark-edged. Length 3.5 mm. *stachydearum* Hardy.
- 14 (13) The fuscous patch near the middle of cell *Cu 2* distinctly and narrowly dark-edged. Length 3 mm.
- 15 (16) Crown with two black spots on the hind margin, confluent behind and forming a V. *collinus* Flor.
- 16 (15) Hind margin of crown with one black spot.
- 17 (18) The black lateral frontal sutures not expanded at the base. *melissae* Curt.
- 18 (17) Each black lateral frontal suture expanded at the base into a roundish spot but little smaller than those on the frons; the face therefore with a transverse row of four black spots at the level of the lower angle of the eye. *thoulessi* J. Edw.
- 19 (6) Pronotum without any dark marking on the disc.
- 20 (25) Elytra with a black spot on the dorsum or the costa, or both.
- 21 (24) Pronotum with a large irregular black spot just behind each eye, and sometimes a pair of black points next the front edge.
- 22 (23) Length 4 mm. The wide irregular fuscous stripe along the elytra continuous. *auratus* L.
- 23 (22) Length 3.5 mm. The fuscous stripe on the elytra usually interrupted near the middle. *atropunctatus* Goeze.
- 24 (21) Pronotum entirely pale. *signatipennis* Boh.
- 25 (20) Elytra without black spots on the dorsum or costa.
- 26 (27) Elytra pale with fuscous stripes. *tenellus* Fall.
- 27 (26) Elytra not striped.
- 28 (29) Elytra whitish-green, generally infusate down the middle. *abrotani* Dougl.
- 29 (28) Elytra yellow, more or less tinged with fuscous at the apex. *filicum* Newm.
- 30 (1) Head across the eyes narrower than the pronotum.
- 31 (32) *R1* pale, concolorous. Upper-side greenish-grey. *germari* Zett.
- 32 (31) *R1* wholly or in part black, and usually other dark markings.
- 33 (38) *Rs* joins the costa at the apex.
- 34 (35) A round deep black spot on *Rs* just before the termen. ... *pulchellus* Fall.
- 35 (34) No such spot.
- 31 (37) Corium pale except a blackish line along the distal edge of the costal callus. *concinus* Germ.

TWO INTERESTING GALL-MIDGES NEW TO GREAT BRITAIN
(DIPTERA, CECIDOMYIDAE.)

H. F. BARNES B.A.

(Research Scholar, Ministry of Agriculture.)

In 1912 the late Abbé J. J. Kieffer described (Marcellia, xi, 1912, pp. 231-2) as new to science *Clinodiplosis nidorum*. This midge was obtained from birds' nests in Austria by Dr. Tölg. During April to May, 1924, Mr. F. W. Edwards, of the British Museum (Nat. Hist.) succeeded in breeding two midges, a male and female, from a thrush's nest found at Weston, Herts. He very kindly handed both the specimens over to the writer, who on examination found the female to agree with the description of *C. nidorum* Kieffer. It is unfortunate that Kieffer did not describe a male midge as well as the female, but in the writer's opinion the male midge bred by Mr. F. W. Edwards is undoubtedly the consort of the female. It is very interesting that a midge whose larvae have such a specialised habitat, and previously only recorded from Austria, should turn up in Great Britain.

The writer has since received a specimen of a midge from Mr. A. H. Hamm, of the Oxford Museum, which he bred from a pupa obtained on February 21st, 1925, from an old nest of a hedge-sparrow at Oxford, the adult emerging on April 29th, 1925. This specimen, on examination, proved to be a male specimen of *C. nidorum* Kieff., so that this additional record, for which the writer is indebted to Mr. Hamm, extends the range of the insect in Great Britain as well as being a record from the nest of a different bird.

In order that this midge may be recognised more readily, the original description is appended :—

'*Clinodiplosis nidorum* n. sp.

D'un jaune très pâle; vertex, flagellum et pattes assombris. Yeux confluents. Palpes de quatre articles dont les deux derniers longs. Articles du flagellum allongées, cylindriques, plus de trois fois aussi longs que gros, les deux premiers connés, le premier à peine plus long que le second, verticilles de filets arqués appliqués comme chez *Dasyneura*, poils arqués, robustes, non en verticilles mais occupant toute la surface de l'article, cols plus longs que la moitié d'un article sauf ceux des deux premiers articles, le dernier article avec un stylet pubescent. Ailes larges, bord antérieur poilu; cubitus arqué, aboutissant en arrière de la pointe alaire, costale interrompue à cet endroit, transversale aboutissant avant le milieu du radius, rameau antérieur de la posticale continuant la direction de la tige, rameau inférieur presque à angle droit. Pattes poilues, crochets tarsaux plus de deux fois aussi longs que l'empodium, courbés presque à angle droit au milieu, ceux des quatre pattes antérieures bifides, les deux postérieurs simples. Oviducte assez longuement proéminent, second article deux fois aussi long que gros, replié sur le dos de l'insecte; les deux lamelles poilues, presque trois fois aussi longues que larges. L. 2.2 mm.—Obtenu par M. le Dr. Tölg de nids d'oiseaux. Autriche.'—Kieffer, J. J., Marcellia XI, pp. 231-2, 1912.

Another gall-midge which the writer wishes to record as occurring in Great Britain is *Therodiplosis persicae* Kieff. At the end of September, 1925, the writer received, through Mr. F. W. Edwards, from Dr. H. Eltringham the larvae and cocoons of a midge feeding on 'red-spider' (*Tetranychus telarius*) living on peach leaves in a hothouse at Stroud, Gloucester. These larvae were blood-red in colour, the largest about 2.5 mm. in length and with mouth-parts of the predaceous type. The cocoons were white and were situated along the midvein and smaller veins, in the majority of cases on the lower surface of the leaves but also occurring on the upper surface in the same position. So far no adults have emerged from this lot of material, but as some of the pupae are still alive in the insectary it appears probable that, whereas under hothouse conditions larvae found in September may hatch into midges during October, such larvae, if placed under natural conditions outside in an insectary, may pupate in the autumn but will not hatch out until the following spring.

A further batch of material, queried as feeding on 'red-spider' on peach near Derby, was received on November 25th, 1925, from Mr. A. Roebuck, of the Midland Agricultural College. Among the material collected there were two adult midges, a male and female, which had been bred out. On detailed examination these specimens proved to be *Therodiplosis persicae* Kieff. This midge was first recorded (Neue Gallmücken-Gattungen, Bitsch, p. 2, 1912) in 1912 by Kieffer from specimens feeding on 'red-spider' on peach in France.

By comparing the two sets of material it appears certain that the midge larvae reported by Dr. H. Eltringham from Stroud are those of *Therodiplosis persicae* Kieff. The original description, as written by the Abbé J. J. Kieffer, is appended:—

'*Therodiplosis* n.g. (Von *Coprodiplosis* verschieden durch die zweispaltigen vorderen Krallen, diese so lang wie das Empodium, untere Lamelle abgestutzt, Flagellumglieder beim Weibchen kurz gestielt.) Sp. Typ: *T. persicae* n. sp. (Rot mit spur von drei Längsbinden, Flagellum und Beine dunkel.) L. 2 mm. Frankreich.'—Kieffer, J. J., Neue Gallmücken-Gattungen, Bitsch, p. 2, 1912.

S.E. Agricultural College, Wye, Kent.

December 1925.

Atheta fordhamiana Keys in the Isle of Wight.—Amongst some *Athetas* which Mr. Keys has kindly identified for me recently there is an example of *A. fordhamiana* from Sandown, taken on September 24th, 1912, a new locality for the insect.—STANLEY A. BLENKARN, Rannoch Lodge, Grovelands Road, Purley: January 3rd, 1926.

Lead Damaged by Insects.—I have lately received a piece of sheet lead about one-eighth of an inch thick which has been perforated in many places by insects. It came from the 'Flask Inn,' a well-known hostelry and farm on the moorland road between Scarborough and Whitby. The floor of the inn was tiled, and some of the oak woodwork of the lower part of the walls had been partially sheathed in lead to protect it from the damp. During repairs in the early summer of last year, it was discovered that much of this woodwork was a mere shell filled with dust, owing to the action of beetles. These, in effecting their escape, had bored in many places completely through the lead sheathing, though in many cases the insects had died before the perforation had been finished. Unfortunately, none of the beetles were brought to me, but the joiner who did the work said 'they were just like those in old furniture,' that is, I presume, *Anobium striatum* Ol. (= *domesticum* Fourc.); the size of the holes would confirm this suggestion.

Other cases of the perforation of lead by insects will be found in Ent. Rec., 1917, p. 60, Ent. Mo. Mag., 1919, pp. 107, 278, and 1920, pp. 10, 12, and Bulletin 1107 (July 1923) of the United States Department of Agriculture gives a lengthy account of 'The Lead-Cable Borer or "Short-Circuit Beetle" (*Scobicia declivis* Lec.) of California.' This last gives a very full though not complete bibliography of the literature of the subject.—GEO. B. WALSH, 41 Gladstone Street, Scarborough: January 16th. 1926.

Rhizophagus bipustulatus F. *ab. gyllenhali* Th.—This aberration is entirely red-brown in colour, without any trace of light spots, and if taken singly might easily be mistaken for *R. perforatus* Er. I took it in Windsor Forest on October 8th, 1925, under bark in company with the type. Though probably common and widely distributed, personally I have never met with it before, and I do not think it has been recorded by name as British.—HORACE DONISTHORPE: January 1926.

Geotrupes spiniger Marsh. *at large in December.*—On December 11th last I picked up in the street at Putney a living perfect specimen of this common *Geotrupes* which was on its back on the pavement. I took it home to make sure of its identification, and then let it loose in my garden. It must have flown some distance from the nearest field, and December seems rather late for these beetles to be on the wing.—HORACE DONISTHORPE: January 1926.

[*G. mutator* is to be seen occasionally on the wing in the Woking district on mild evenings during November and beginning of December.—G.C.C.]

Aphodius rufipes L. *at light.*—On the evening of July 2nd, 1925, after dinner, this species flew into my study through the open window. The atmosphere at the time was very close and sultry, as a storm was threatening.—HORACE DONISTHORPE: January 1926.

Marriage (?) flight of ♂♂ of Pseudoccus gahani Green.—On October 7th last I noticed that, in my front garden in Hazlewell Road, Putney, and in the road, the air was full of a number of male Coccids. Their movements were graceful and slow, and they appeared to glide, rather than to fly, through the air. On going up to my study to get a net I found that they were just as numerous outside the window, and below in the back garden. Some of them were caught, set, and given to Mr. Laing of the British Museum. Mr. Green, who was at the Museum when I arrived, told me they were the males of *P. gahani*; and as he appeared to be very interested in the phenomenon it seems advisable to record the same.

I first met with this Coccid at Putney in 1920, specimens being taken on my study window, and on the creeper outside. In 1921 I found a colony on a laburnum tree in Oakhill Road, East Putney, where I have observed it ever since—to-day, January 1st, 1926, it is more abundant there than ever. In 1925 great numbers of *P. gahani* occurred on an acacia tree in the Hazlewell Road; the leaves and lower branches being withered and dead—no doubt the work of the Coccid.—HORACE DONISTHORPE, 19 Hazlewell Road, Putney: January 1926.

Gastrophilus equi F. on mountain tops.—With reference to Dr. Hugh Scott's note on this species in the January number of this Magazine (*antea* p. 19), my own experiences with it on the top of Rough Tor last August may be of interest. A number of males were found settled on the Rocking Stone at the top of the hill; unless disturbed they were making no attempt to fly, but were all emitting a buzzing sound very similar to that produced by *Arctophila mussitans* and other Syrphidae. Apparently they were awaiting the approach of females in order to pair, for on one of the latter flying past six males immediately started in pursuit—three succeeded in overtaking the female and the four fell to the ground together where I was able to box them. I did not observe females round the legs of the ponies which were on the moor, but they were excessively common in the lower surrounding districts, practically every farm horse having its attendant flies.

It may also be of interest to record that one of the common wasps—either *V. vulgaris* or *V. germanica*—was excessively common on the top of Rough Tor: several nests were situated in a grassy bank close to, and on a level with, the cairn.—A. S. BUCKHURST, The Briars, Ox Lane, Harpenden: January 20th, 1926.

Captures of Tachinidae in the Oxford district during 1925.—For several years I have given some attention to the Dipterous family Tachinidae. Like every student of a fresh group, I have met with the usual difficulties with regard to names, and many of my problems have been kindly solved by Mr. J. E. Collin and Mr. C. J. Wainwright during the past year. The list of my 1925 captures given below has been worked out without any outside help with one or two exceptions, which were taken for the first time this year. I am sure no one will be more gratified than the Dipterists mentioned that their time spent in naming my early material has not been altogether wasted.

The following species have been met with by me in the neighbourhood of Oxford:—*Parathorocera* (*Ceromasia*) *senilis* Mg., Tubney, August 1923, three specimens; *Lydella* (*Dexodes*) *stabulans* Mg., Yarnton and Water Eaton, Oxon, Tubney and Cothill, Berks., a common species; *Nemorilla* (*Exorista*) *notabilis* Mg., Yarnton, July 1925, one only; *Megalochaeta ambulans* Mg., Tubney, several in August 1925; *Phorocera cilihedra* Rnd., of general occurrence on flowers of *Pastinaca sativa* in the Oxford district in July and August, at Water Eaton and Yarnton, Oxon, and Tubney, Berks.; *P. caesifrons* Mcq., Hitch Copse, Besselsleigh, Berks., by sweeping in June, six specimens, and at Wood Eaton rather commonly; *Phryxe* (*Blepharidea*) *vulgaris* Fall., of general occurrence throughout Oxford district, parasitic on various forms of Lepidopterous larvae; *Blepharidopsis nemea* Mg., sparingly at Tubney, Kirtlington, etc., I have seen a series bred from *Phlogophora meticulosa* larvae; a close ally of *P. vulgaris*; *Compsilura* (*Phorocera*) *concinna* Mg. = *P. serriiventris* Rnd. (Verrall's list), Tubney and Yarnton, August 1925, not uncommon, another species parasitic on Lepidoptera; *Chaetotachina rustica* Mg., a common species

at Oxford, also a Lepidopterous parasite, specially common at Yarnton in August last; *Epicamptocera succincta* Mg., on parsnip flowers, quite common, I saw at least a score in August 1925, Wood Eaton, Yarnton, Kirtlington and Tubney, it superficially resembles a 'Blue-bottle'; *Macquartia praeifica* Mg. = *spinicincta* Meade, Yarnton, August 1925, two specimens, rather rare. First taken in 1922, two specimens, then in August 1924, at Stanton St. John, Oxon, six specimens in all; *Macquartia grisea* Fln., Hitch Copse, Tubney and Yarnton, four examples; *Degeeria ornata* Mg., Yarnton, August 1925, on parsnip flowers, five specimens taken also in 1923 and 1924 at the same place; ? *Degeeria* (*Discochaeta*) *muscaria* Fln., Tubney, July 1925, a series beaten out of bracken, in this and former years. I suspect it to be parasitic on the Homopteron *Stiroma pteridis* Boh. This fly was first taken at Tubney by the late G. H. Verrall, but recorded by him in error from Tangham Wood, Suffolk (*teste* J. E. Collin in litt.), under the name of *Vibrissina turrita* Mg. (E.M.M. 1912, p. 191). Mr. C. J. Wainwright, who has studied a series of the Tubney fly captured in 1924, and has supplied the name as above, has no evidence that *V. turrita* can be regarded as a British insect. (The generic position is somewhat uncertain.—C.J.W.). *Anachaetopsis ocypterina* Ztt., Yarnton, sometimes common, also at Tubney; *Eriothrix rufomaculata* DeG. (= *Olivieria lateralis* F.), common, but not as abundant as in August 1924, when it swarmed on parsnip flowers even by the road-sides; *Pelatachina tibialis* Fln., one example beaten from a poplar at Wood Eaton, June 1925; *Ernestia* (*Erigone*) *radicum* F., Besselsleigh and Tubney, on flowers of *Angelica* in and near woods, August 1925; *Thelymorpha marmorata* F., Yarnton, Oxon, August 1925, only one; *Voria* (*Plagia*) *ruralis* Fln., Yarnton, August 1925, three examples; *Wagneria* (*Phorichaeta*) *lentis* Mg. = *tricincta* Rnd., Tubney, May 1925, where I have taken it twice previously, and once at Wytham; *Bucentes* (*Siphona*) *geniculata* DeG., common everywhere around Oxford; *B. cristata* F., much less frequent. The genus is easily recognised by the geniculate proboscis, but the species are closely related, and are readily separated by the presence or absence of certain bristles on the abdomen; *Ptilocerina* (*Rhinophora*) *melania* Mg. ? = *atramentaria* Mg., not uncommon at Yarnton, June and August, evidently double-brooded. I have also taken one at Tubney. Mr. Wainwright is of opinion that the Yarnton *Ptilocerina* is *melania*, 'that *atramentaria* is a larger insect with more white tomentum on the abdomen, and it is not a shining black insect like *melania*'; *Loewia* (*Fortisia*) *petiolata* R-D., near Besselsleigh, Berks., August 1925, one specimen; *Rhinophora* (*Clista*) *lepida* Mg., common at Tubney, Yarnton, and elsewhere; *Melanophora roralis* L., one in a spider's web on an oak tree at Water Eaton, Oxon, June 1925. *Alophora pusilla* Mg. occurs in widely separated localities in Oxford district. *Brachycoma devia* Fln.; this viviparous fly, when captured, immediately extrudes clusters of minute larvae, which rapidly disperse across the hand when held between the fingers. A ♀ specimen taken in 1924 behaved in the same way (cf. E.M.M. 1924, p. 262); *Phyto melanocephala* Mg., Tubney, August 1926, common at the same locality in August 1924, the ♀ is more shining black than the ♂, which is greyer in tint (the ♀ = *P. nigra* Dsv., *teste* C. J. Wainwright); *Onesia agilis* Mg., generally common throughout the Oxford district and varies considerably in size, specially abundant on flowers at Cothill, August 1925; *O. gentilis* Mg., also common, Yarnton and Tubney; *O. cognata* Mg., less frequent at Yarnton, Tubney and Water Eaton, a close ally of *O. gentilis*.

The species of *Sarcophaga* are generally recognised as difficult to determine, dissection of the ♂ organs being necessary to name some of them. Knowing this I prepared my material and submitted it in February 1925 to Mr.

Wainwright, who named and made me types of sixteen species. This year I took twelve species of *Sarcophaga* and recognise them as under :—

Sarcophaga carnaria L. and *S. vicina* Villen are large and very similar species, but the ♂ organs are quite distinct, both are common ; *S. striata* Mg., Yarnton, common ; *S. melanura* Mg. ; *S. nigriventris* Mg. ; *S. crassimargo* Rnd. ; *S. frenata* Pand., I took five ♂♂ at Yarnton, the red segment of the exposed aedeagus showing conspicuously when they are feeding on the flowers ; *S. haemorrhoea* Mg., Yarnton, August 1925, one specimen, one taken also in August, 1924 ; inseparable in the field from *S. frenata*, but quite distinct from that insect ; *S. setipennis* Rnd., Yarnton, August 1925, several in 1924 ; *S. dissimilis* Mg., a common species in the Oxford district ; *S. sinuata* Mg., two ♂♂ and one ♀ from Yarnton, August 1925, first taken at Water Eaton, Oxon, July 1924 : a rarity in the district ; *S. offuscata* Schin., Cothill, August 1925, taken more frequently in 1924. Seven of the species without comment are generally common at Oxford ; *Nyctia halterata* Pz., fairly common, but not observed in numbers this year as in some seasons, occurs throughout Oxford district ; *Engyops micronyx* Br. and Brg. : this has only been taken at Yarnton : not common, four specimens in August 1925.

Yarnton, mentioned so much in my paper, is three miles N.W. of Oxford, and being conveniently accessible I often collect there in the summer evenings.

Miltogramma punctatum Mg., Tubney, scarce this year ; a parasite of Aculeate Hymenoptera, sometimes common, when it may be seen following, resting near, or entering the burrows of *Colletes*.

Other Tachinidae taken at Oxford in previous years named by Mr. Collin, Mr. Wainwright and myself include such interesting species as *Meigenia floralis* Mg., Yarnton and Tubney ; *Meigenia bisignata* Mg., Tubney, one ; *Lydella nigripes*, Tubney 1924, two ; *Gymnochaeta viridis* Flin., May 1924, on sloe blossom, Tubney ; *Phryxo (Exorista) vetula* Mg., Wood Eaton, June 1923, one ; *Megalochaeta (Epicampocera) conspersa=ambulans* Mg., Waterperry Wood, near Stanton St. John, Oxon., May 1923, one ; *Ceromasia sordidisquama*, Wood Eaton, Waterperry Wood, Tubney, etc. ; *Gonia divisa* Mg., Tubney, 1914 ; *Gonia ornata* Mg., Tubney, 1919 ; *Monochaeta leucophaea* Mg., Wood Eaton, May 1923 ; *Lypha (Aporomyia) dubia* Flin., Tubney, Wytham and Wood Eaton, May 1923, common on tree trunks, Tubney, May 1923 ; *Lydia (Somolia) aenea* Mg., Stanton St. John, not common ; occurs on the Chilterns and Berkshire Downs ; *Macquartia chalconota* Mg., Wytham and Woodstock, 1914. I bred a series from larvae of *Chrysomela varians* found here, and in June 1924 I bred more parasites than beetles from larvae of the same insect found at Yanworth, Gloucestershire ; *Minella (Ptilops) chalybeata* Mg., Tubney, 1922 ; Hell Copse, Stanton St. John, 1921 ; Yarnton, 1924 ; widely distributed, but rare ; *Myioba inanis* Flin., Tubney, 1924, only once seen. I have also had it from the Berkshire Downs ; *Panzeria (Erigone) minor* Vill., Wood Eaton, 1924, one specimen ; *Panzeria rudis* Flin., Hell Copse, 1920, one specimen ; *Paraplecta (Plagia) trepida* Mg., Yarnton, 1924, two examples ; *Wagneria latifrons* Zett., Wytham, June 1914 ; Cothill, May 1914, ♂ and ♀ (teste C. J. Wainwright, who had previously seen one other British specimen) ; *Rhacodineura (Roeselia) antiqua* Flin., Tubney, Yarnton, etc. ; *Actia (Thryptocera) pilipennis* Mg., Waterperry Wood, one by sweeping ; *Digonochaeta setipennis* Flin., Wood Eaton, Sunnymede and Tubney, about five specimens ; *Bucentes (Siphona) cristata* F., Wytham, 1914, Oxford, 1925 ; *Trixa oestroidea* Dsv., Tubney, Wytham and Yarnton, not common ; *Loewia (Fortisia) intermedia* Br. and Brg., Yarnton, August 1924, one specimen, teste C.J.W. who had previously seen specimens from Nottingham ; *Presina (Stevenia) maculata* Flin., Yarnton, August 1924,

another seen at Tubney settling on a flower, but missed, in the same month; *Onesia aculeata*, Wytham, Berks., August 1914, one; *Sarcophaga clathrata* Mg., Waterperry Wood, May 1920, one; *S. flea* Rond., Yarnton, August 1922, one; *S. haematodes* Mg., Tubney, August 1924, one; *S. pumila* Mg., Yarnton, June 1924, several; *Mitogramma germari*, Tubney, August 1905, rare; at the time I thought the insect was the much more common *M. punctatum*, until I met with the latter species, when I saw it was different, and sent it to Mr. Collin, who, on July 13th, 1924, took a specimen of *M. germari* at Tubney; *Ptychoneura (Metapodia) cylindrica* Flin., Tubney, July 13th, 1924, one specimen (named by Mr. Wainwright); *Metopia leucocephala* Rossi, Tubney, at and near burrows of Aculeate Hymenoptera, sometimes common; *Sphixapata conica* Flin., Tubney, same habits as the preceding; *Prosenia sybarita* F., Tubney and Cothill, 1920, 1921; *Dexia rustica* F., Tubney, 1924, not common; *Dinera griseascens* Flin., Wytham, 1914, two specimens.

This does not by any means exhaust the records of Tachinidae from the Oxford district; my friend Mr. A. H. Hamm, I have not the least doubt, could add considerably to this list. It is his ambition, I know, to publish a complete list of the Diptera of the Oxford district, and I have been able to supply him with many interesting captures in other families of the Order for this purpose.—J. COLLINS, 74 Islip Road, Sunnymede, Oxford: December 1925.

CORRIGENDUM.—*Host of Litomastix aestivalis*.—Vol. LXI, p. 257, November 1925: for *Hepialus humuli* L. read *Parastichtis monoglypha* Hufn.—J. W. SAUNT, Epperstone, Bull's Head Lane, Stoke, Coventry: January 8th, 1926.

Obituary.

Dr. Ernst Evald Bergroth, the celebrated Finnish Hemipterist, as briefly announced on p. 45 of our last issue, died at his home at Ekenäs on November 22nd, 1925. He was the son of Julius Efraim Bergroth, and was born at Jakobstad on April 1st, 1857. In 1874 he matriculated at the University of Helsingfors, where he afterwards studied Natural Science. He obtained his Bachelor degree in 1879, and then transferred his attention to the faculty of medicine, graduating as Bachelor of Medicine in 1882. In 1884 he went to Stockholm to study, and in 1886 passed the examination by which he became a licentiate in medicine. The following year Bergroth obtained the post of parish doctor at Tammela. In 1890 he went to study at Berlin, and on his return to Finland in 1891 he was appointed medical officer at Tammerfors, a post he held for fifteen years. In 1906 Bergroth went to the United States of America, where he set up a practice at Duluth, a town at the western extremity of Lake Superior. He returned however to Finland in 1911, and was appointed medical officer over the Turvola district. He afterwards became provincial medical officer at Jämsä, from whence he obtained a transfer in 1921 to the Ekenäs provincial district. Here he remained until his death.

Bergroth's interest in Natural Science was well developed at an early age, and at the University was well fostered by his association with O. M. Reuter and J. Sahlberg. In 1875 he became a member of the Society for the study of the fauna and flora of Finland, of which he was Librarian from 1876–1884, and it is to this occupation that he owed his very extensive bibliographical knowledge. In 1877 he undertook an expedition to Yenissej in Siberia, and it is from that time that his work on Natural Science may be said to have started. Although he took a keen interest in such widely diverse groups as Pisces and Arachnida, he confined himself chiefly to the Insecta. He first took up the study of the

Tipulidae (Diptera), but soon began to specialise in the Heteroptera, on which group he ultimately became a leading authority. He was a splendid linguist and was equally at home when writing in Latin, German, French, Swedish or English, and it was this ability which made him so widely conversant with contemporary literature. He was the author of very numerous papers on Exotic Hemiptera dealing with various phases of the subject and his total list of scientific papers numbers nearly 300, 19 of which were published in this Magazine, the first in 1885 and the last in 1924. Amongst other recognitions of his work he was elected an honorary member of the Entomological Societies of Helsingfors, Berlin, Leyden and Stockholm, and a corresponding member of the Zoological Society of London. In 1886 he married Eva Sucksdorff, by whom he had three sons and one daughter. Dr. Bergroth was a brilliant entomologist. He preferred to maintain a grasp of the whole of the Hemiptera rather than to specialise in any one family, and his great experience in the group and his extensive bibliographical knowledge enabled him to see at once the faults in the work of other writers. In consequence he was apt at times to write scathing but well-founded criticisms of work which he believed to be unsound. Dr. Bergroth possessed probably more than O. M. Reuter that exact and detailed scientific knowledge which must be brought to bear on the study of the Hemiptera if the problem of their classification is to be correctly elucidated. His death is a severe blow to those younger Hemipterists who had learnt to rely on the wisdom of his judgment, and to whom his advice was never refused. Further particulars of his life, and a portrait, are given by Runar Forsius in Part 4 of the 'Notulae Entomologicae' for 1925, from which our notice is mainly taken. The same periodical includes a posthumous paper by Bergroth on a new Membracid (*Pyrgonota fenestrata*) from the Philippines.—W.E.C.

William Bateson, M.A., F.R.S., for many years our most distinguished authority on the theory of Heredity and the Mendelian doctrine of Evolution, died on February 8th after an illness of brief duration, at his residence at Merton, Surrey. He was born at Whitby in 1861, his father being the Rev. W. H. Bateson, D.D., Master of St. John's College, Cambridge, where, after a distinguished career as an undergraduate, the subject of our memoir entered upon the biological researches which have conferred on him a world-wide reputation. In his earlier years he travelled widely over most of Europe, and even far into Western Asia, accumulating records and specimens for his first great work, 'Materials for the Study of Variation' (1894), now generally admitted as marking an epoch in biological thought. In 1908, when his classic work on 'Mendel's Principles of Heredity' appeared, he was elected to the Chair of Biology in the University of Cambridge, which he resigned in 1910 to become Director of the John Innes Horticultural Institute at Merton, which before his decease he had raised to the status of one of the finest centres of research in the world.

Many scientific honours came to him during his lifetime, including the Darwin Medal of the Royal Society in 1904, and culminating in a Royal Medal in 1920, besides a Trusteeship of the British Museum by election.

Although Entomology was perhaps not Bateson's chief interest, he possessed a sound and extensive knowledge of our Science, on which he drew largely in his published works. He became a Fellow of the Entomological Society of London in 1894, and at the time of his death was one of its two Trustees. Last year he was nominated Vice-President, and those who saw him in the Chair, in

the absence of the President, at the recent Annual Meeting of the Society, and afterwards listened to his genial and animated conversation, little dreamed that the end was so near at hand.

He is survived by his widow and one son, now an undergraduate at Cambridge. Our most sincere condolence and sympathy go out to them in their bereavement.

ON A COLLECTION OF CARABIDAE FROM THE KUMAON-TIBETAN FRONTIER.

BY H. E. ANDREWES, F.E.S.

In his expedition to the extreme North of Kumaon and over the Tibetan frontier Mr. H. G. Champion explored much new country at a great elevation, and brought back with him considerable collections of insects, among which is a number of Carabidae.

Leaving Almora, Mr. Champion passed through the Sarju Valley, reaching the Gori river at Munsiri. The Gori Valley was followed up to Burphu and Milam, both at about 11,500 feet, and thence a pass was crossed into the Girithi Valley. A little further North the Tibetan frontier was reached near Sheshel and Laptel, at about 15,000 feet, and a short excursion was made into Tibet along the valley of the Supi river, an affluent of the Sutlej, which rises at no great distance in Lake Manasarowar.

The species and varieties of Carabidae enumerated here number sixty-six, including twelve new ones, which are described further on; most of the latter had not previously been met with, but others, apparently more widely distributed, had already been found further South and at lower elevations both by Mr. Champion and in one or two cases by other collectors. The types of all the new species have been placed in the British Museum.

Most of the species inhabiting the higher regions of the Himalayas belong, as we should expect, to Palaearctic genera, and this proves to be the Southern limit, at least in Asia, of a good many of them; a few, such as *Dioryche* and *Colpodes*, are common in tropical Asia, and in the Himalayas reach their Northern limit; others again, like *Tachys* and *Bembidium*, have a world-wide distribution. As a question of zoo-geography it is interesting to note that, of the sixty-six species, sixteen appear to be confined to Kumaon and the adjoining districts of the United Provinces, an additional seventeen occur only in North-West India, four are common to Kumaon and Sikkim, eleven are found more or less along the whole Himalayan tract, while sixteen have a wider range, extending in some instances to Indo-China, Formosa and the Malay Islands. In the case of the two remaining species,

Nebria limbiger has a habitat extending from North West India through Kashmir to Turkestan, while *Anchomenus quadripunctatus* has a world-wide distribution in the Palaearctic and Nearctic regions.

The following is a list of the species in the collection, and at the end will be found the descriptions of the new ones.

1. *Omophron axillaris* Chaud., Rev. et Mag. Zool., 1868. 60.
Sarju Valley, 5,000'. Taken also in the Almora and Haldwani divisions.
2. *Omophron oberthüri* Gestro., Ann. Mus. Civ. Gen., 1892. 962.
Sarju Valley, 5,000'. Mr. Champion took this species abundantly in the Almora and Haldwani divisions, and Mr. H. Stevens found it equally abundant in Sikkim.
3. *Nebria pallidipes* Breit., Col. Rundsch., 1914. 158.
Milam, Gori Valley, 11,500'. The name *macrocephala*, originally used, disappears owing to its prior use by Motschulsky.
The species was described from Poo, which appears to be near the South-Western border of Tibet. A single specimen was taken by Mr. S. N. Chatterjee in the Chakrata division.
4. *Nebia limbiger* Solsky in Fedchenko's Turkestan, Zool., Col. i, 1874. 13.
Shelshel, 15,750'. Turkestan, Pamir, Kashmir, Western China
5. *Notiophilus orientalis* Chaud., Bull. Mosc., 1850. ii. 428.
East Ramganga Valley, 5,000'. Described originally from Simla, the species has been taken here and there in Kumaon and the Punjab. Mr. F. W. Champion took an example as far west as Parachinar in the Kurram Valley.
6. *Notiophilus radians* sp. n. (see p. 70).
7. *Carabus boysi* Tatum, Ann. Mag. Nat. Hist. (2), viii, 1851. 51.
Samgong, 13,500', to light. The commonest species in the *Imaibius* group. It occurs throughout the mountains of Southern Kashmir, Northern Punjab, Garhwal, and Kumaon.
8. *Carabus waga* Fairm., Ann. Soc. Ent. Fr., 1882. 65.
Girithi Valley, 14,000'.
The species was described from a single ♀ specimen taken by Mr. Stanislas Rembielinski, and sent to Fairmaire by Professor Waga. According to the description it came from North India, but is actually labelled 'Tibet.' I have not been able to make a comparison, but the specimens agree fairly well with the description, as far as it goes, and with the notes I made when examining the type in M. René Oberthür's collection. The brown coloration mentioned by the author is probably due to immaturity. The specimens taken by Mr. Champion are black, with a slight and variable amount of bronze-colour (sometimes greenish) chiefly on the humeral border and round the punctures.
Mr. Oberthür kindly gave me specimens of another species of *Carabus*, quite distinct from *C. waga*, which he had received from the neighbourhood of Gnatong, on the Sikkim-Bhutan frontier. This I described (Ann. Mag. Nat. Hist. (9), vii, 1921, 407) under the name of *C. sanchari*. I have seen examples of this species, bearing the name *C. waga*, in two other collections, though to whom this misidentification is due I do not know, and a third appears to be the specimen described by Mr. Lapouge (Misc. Ent., 1921, 118 (Sept.)).

Fairmaire's description being quite inadequate, I re-describe the species further on (see p. 70).

9. *Coryza semirubra* sp. nov. (see p. 71).
10. *Tachys bombycinus* Andr., Ann. Mus. Civ. Gen., 1925. 385.
Sarju Valley, 5,000'. Kumaon, Sikkim, and Eastern Duars.
11. *Tachys rhombophorus* Andr., Ann. Mus. Civ. Gen., 1925. 390.
Sarju Valley, 4,000'. Distribution as in the previous species.
12. *Tachys poecilopterus* Bates, Trans. Ent. Soc. Lond., 1873. 331.
Sarju Valley, 4,000'. Commonly distributed throughout the greater part of South-East Asia.
13. *Tachys tagax* Andr., Ann. Mus. Civ. Gen., 1925. 444.
Sarju Valley, 5,000'. Kumaon and Sikkim.
14. *Tachys comptus* Andr., Ann. Mag. Nat. Hist. (9), x, 1922. 161.
Var. *borealis* Andr., Ann. Mus. Civ. Gen., 1925. 462.
Sarju Valley, 5,000'. Kumaon, Sikkim, Chota Nagpur, Formosa.
15. *Bembidium pluto* Andr., in Mission Babault, Carab., 1924. 72, t. 1, f. 3.
Sangeha, 14,500'; Laptel, 15,000'; Shelshel, 15,750'. Taken with *Geodromicus* in running water. Previously known from Rukshu and Ladak.
16. *Bembidium persephone* sp. nov. (see p. 72).
17. *Bembidium clarum* Andr., Ent. Month. Mag., 1923. 98.
Gori River Gorge, 5-9,000'. In the single example found, the striae of the elytra are rather deeper than in the type form. Kumaon, Garhwal, Sikkim, Assam, Manipur.
18. *Bembidium eurydice* sp. nov. (see p. 73).
19. *Bembidium cimmericum* Andr., Ent. Month. Mag., 1922. 238.
Var. *ornum* Andr., Ent. Month. Mag., 1922. 239.
Gori River Gorge, 5-9,000'; Burphu, Gori Valley, 11,500'. Among shingle at edge of Gori River. Previously taken only in the Sunderdhunga Valley.
20. *Bembidium regale* Andr., Ent. Month. Mag., 1922. 174.
Gori River Gorge, 5-9,000'. Known only from the United Provinces: Haldwani, Tanakpur, and River Sarda Gorge.
21. *Bembidium radians* Andr., Ent. Month. Mag., 1922. 177.
Gori River Valley, 5-9,000'. A common mountain species: Simla Hills, Kumaon, Sikkim.
22. *Bembidium charon* sp. nov. (see p. 74).
23. *Bembidium bracculatum* Bates, Proc. Zool. Soc., 1880. 212.
Gori River Gorge, 5-9,000'; Milam, Gori Valley, 11,500'; Laptel, 15,000'. Only known previously from Kashmir. The type, which is the only other specimen I have seen, was said by Bates to come from the Goorais Valley, but it is actually labelled 'Skardo.'
24. *Bembidium babaulti* Andr., in Mission Babault, Carab., 1924. 80, t. 1, f. 7.
Gori River Gorge, 5-9,000'; Gori Valley, 7,000'. Kulu, Simla Hills, Kumaon. The colour in this species is very variable, and these examples show only a pale apical spot, with a vague reddish tinge round the base of the elytra.
25. *Bembidium notatum* Andr., Ent. Month. Mag., 1922. 175.
Gori Valley, 7,000'. Kumaon, Bihar, Assam.
26. *Bembidium himalayanum* Andr., in Mission Babault, Carab., 1924. 74.
Tibet, Supi River, 15,000'. Hitherto recorded only from Lahoul and the Kurram Valley.

27. *Bembidium cameroni* Andr., Ent. Month. Mag., 1922. 177.
Gori River Gorge, 5-9,000'. The species belongs to the sub-genus *Pseudolimnaeum*, in which the basal half of the median thoracic furrow is widened out into a deep groove. It was described from the Simla Hills.
28. *Perileptus indicus* Jeann., Ann. Mag. Nat. Hist. (9), xii, 1923. 399, f. 2.
Sarju Valley, 5,000'. Kumaon, Sikkim, Eastern Duars, Assam, Manipur.
29. *Lissopegonus glabellus* Andr., Ann. Mag. Nat. Hist. (9), xii, 1923. 214.
Sarju Valley, 5,000'. Kumaon, Sikkim, Assam, Laos.
30. *Axonyia championi* Andr., Ann. Mag. Nat. Hist. (9), xii, 1923. 680; *id.* in Mission Babault, Carab., 1924. 22, t. 2, f. 5.
Sarju Valley, 5,000'. Punjab, United Provinces, Sikkim, Assam-Bhutan frontier.
31. *Callistomimus chalcocephalus* Wied., Zool. Mag. ii, 1, 1823. 57.
Sarju Valley, 4,000'; East Ramganga Valley, 5,000'. A very widely distributed species: Jhelam Valley, Kumaon, Sikkim, Nilgiri Hills, Burma, Java, Krakatau, Southern China.
32. *Callistomimus coarctatus* Laf., Ann. Soc. Ent. Fr., 1851. 230.
Sarju Valley, 4,000'. Punjab, Kumaon, Sikkim, Eastern Duars.
33. *Chlaenius punctatostriatus* Chaud., Bull. Mosc., 1856. iii, 244.
Sarju Valley, 5,000'. A common species, occurring along the Himalayan tract from the Sutlej to Bhutan, and re-appearing in Yunnan and Laos. In the collection of the Stettin Museum there is an example labelled Ceylon (Nietner), but there is probably some error here.
34. *Chydæus obscurus* Chaud., Bull. Mosc., 1854. ii, 344.
Gori River Gorge, 5-9,000'; Gori Valley, 7,000'. A common Sikkim species, but not hitherto recorded from Kumaon.
35. *Chydæus bedeli* Tchitch., Abeille xxix, 1897. 66.
Gori River Gorge, 5-9,000'. Punjab, Kumaon, Sikkim, Western China.
36. *Dioryche torta* MacL., Ann. Jav. 1825. 21.
Gori Valley, 7,000'. Widely distributed through South-East Asia, including the Malay Islands.
37. *Dioryche colombensis* Nietn., Journ. As. Soc. Beng., 1857. ii, 151.
Var. *braccata* Bates, Compt. rend. Soc. Ent. Belg., 1891. 330
East Ramganga Valley, 5,000'. Both the type form and variety occur plentifully throughout India, but in Ceylon and the Maldivé Islands only the type form is found.
38. *Harpaliscus birmanicus* Bates, Ann. Mus. Civ. Gen., 1892. 341.
Sarju Valley, 5,000'. Extremely common throughout Sikkim, Assam, Manipur, Burma, and Indo-China; rarer in Garhwal and Kumaon.
39. *Harpalus indicus* Bates, Compt. rend. Soc. Ent. Belg., 1891. 332.
Gori River Gorge, 5-9,000'. Widely distributed in the Himalayas.
40. *Harpalus melaneus* Bates, Proc. Zool. Soc., 1878. 714.
Burphu and Milam, Gori Valley, 11,500'. Common enough in the mountains of North-West India, but not extending to Sikkim and Assam.
41. *Harpalus indicola* Bates, Proc. Zool. Soc., 1878. 714.
Gori River Gorge, 5-9,000'. Plentiful throughout the Himalayan tract.
42. *Hypsinephus ellipticus* Bates, Proc. Zool. Soc., 1878. 716.
Tibet, Supi River, 15,000'. Found under stones, sometimes in pupal cell. Previously recorded only from Kashmir; Pangong Valley and Baltal.

43. *Trichotichnus liparus* sp. nov. (see p. 74).
44. *Stenolophus bajaurae* Andr. in Mission Babault, Carab., 1924. 95.
Sarju Valley, 4,000'. Kashmir, Punjab, United Provinces, Bihar.
45. *Amara* (sens. str.) *darjelingensis* Putz., Stett. Ent. Zeit., 1877. 102.
Gori Valley, 7,000'; Burphu, 11,500'; Gori River Gorge, 5-9,000'.
Kumaon, Sikkim, Assam.
46. *Amara* (*Bradytus*) *compacta* Bates, Proc. Zool. Soc., 1878. 717.
Gori River Gorge, 5-9,000'; Burphu, Gori Valley, 11,000'. A common
Himalayan insect from Kashmir to Sikkim.
47. *Amara* (*Niphobles* subgen. nov.) *splendens* sp. nov. (see p. 75).
48. *Amara* (*Cumeres*) *thalia* sp. nov. (see p. 76).
49. *Abacetus guttula* Chaud., Bull. Mosc., 1869. ii, 374.
Sarju Valley, 4,000'. Common in North India and as far south as the
Central Provinces, at Kandy in Ceylon, and in Burma.
50. *Pterostichus championi* sp. nov. (see p. 76).
51. *Calathus himalayae* Bates, Entom., 1891, Suppl. 9.
Gori River Gorge, 5-9,000'. Kulu, Rotang Valley, Kumaon.
52. *Calathus kollari* Putz., Ann. Soc. Ent. Belg., 1873. 72.
Gori River Gorge, 5-9,000'. One of the commonest mountain species
from Baluchistan to Sikkim.
53. *Calathus atrema* sp. nov. (see p. 77).
54. *Colpodes semistriatus* Chaud., Ann. Soc. Ent. Fr., 1878. 365.
Gori Valley, 7,000'. Kumaon and Sikkim.
55. *Euleptus ooderus* Chaud., Bull. Mosc., 1850. ii, 365.
East Ramganga Valley, 5,000'; Gori Valley, 7,000'. Confined to the
mountains of North-West India.
56. *Anchomenus lissopterus* Chaud., Bull. Mosc., 1854. i, 136.
Gori Valley, 7,000', and Burphu, 11,5000'. Common throughout the
Himalayan tract.
57. *Anchomenus quadripunctatus* Deg., Mém. Ins., iv. 1774. 102.
Milam and Burphu, both 11,500'; Gori Valley, 14,000'. A single speci-
men was taken by Mr. E. C. Ansorge at Simla, and other examples
in the British Museum were taken at Lhasa and Gyantse, 13,000', by
Mr. H. J. Walton in the Tibetan Expedition, 1904.
The species occurs all round the world in the Palaearctic and Nearctic
zones, but until these specimens came to hand, when Mr. G. C.
Champion put a note into the Ent. Month. Mag. (1925, '01), had not
been recorded from the Himalayas.
Mr. G. C. Champion informs me that in England he took it plenti-
fully near Woking in pine woods after a fire, and since then it has
been taken at Wellington College; Sahlberg took it under somewhat
similar circumstances in Finland. As is usually the case with widely
distributed species there is considerable variability among individuals,
on which see August Morawitz (Beitrag zur Käferfauna der Insel Yesso,
1863, 43).
58. *Anchomenus caesiti* Andr. in Mission Babault, Carab., 1924. 104.
Gori River Gorge, 5-9,000'; Gori Valley, 7,000'; Burphu, 11,500'.
Among shingle at edge of Gori River. Lahoul, Kulu, Kumaon.
59. *Anchomenus eurous* Andr. in Mission Babault, Carab., 1924. 105.
Gori River Gorge, 5-9,000'; East Almora Division, Gori Valley.
Girgaon path to Munsiri, 6-8,000'. Kulu, Spiti, Kumaon.
60. *Anchomenus viridicans* sp. nov. (see p. 78).

61. *Lebia boysi* Chaud., Bull. Mosc., 1850. i, 70.
Gori River Gorge, 5-9,000'. Punjab and Kumaon.
62. *Mochtherus tetraspilatus* MacL., Ann. Jav., 1825. 25.
Sarju Valley, 4,000'. Common throughout South-East Asia.
63. *Risophilus himalayicus* Andr., Ann. Mag. Nat. Hist. (9), xii, 1923. 688.
Sarju Valley, 5,000'. Confined to Kumaon.
64. *Cymindis alticola* sp. nov. (see p. 79).
65. *Mastax annulatus* Andr. in Mission Babault, Carab., 1924. 111, t. 4, f. 4.
Sarju Valley, 5,000'. Punjab, Kumaon.
66. *Mastax laeviceps* Bates, Compt. rend. Soc. Ent. Belg., 1891. 337.
Sarju Valley, 5,000'. Punjab, Kumaon, Sikkim, Eastern Duars, Burma.

Notiophilus radians sp. nov.

Length : 5.0 mm.

Dark bronze above ; underside, legs, and antennae piccous, joints 2 to 4 of the latter more or less ferruginous.

Head wide, only just narrower than prothorax, with eight fine, nearly parallel carinae between the eyes, neck strongly alutaceous, clypeal suture deep, clypeus somewhat raised, longitudinally striate in front, a transverse interrupted sulcus behind, eyes very large, antennae not reaching base of prothorax. *Prothorax* rather flat, a little narrower than elytra, nearly a third wider than long, widest close to front angles, where there is a seta, thence with the sides straight to hind angles, which are right ; median line very short, basal foveae deep and rounded, margins widely and fairly densely punctate, disk smooth. *Elytra* rather flat, two-thirds longer than wide, punctate-striate, striae 1 and 2, together with scutellary striae excessively fine and traceable only by the minute punctures (though 1 is distinct close to apex), the other striae gradually increasing in depth towards sides, interval 2 as wide as 3 and 4 together, 1, 5, 6 and 7 about a third of 2, 8 at middle equal to 3, intervals 1 to 3 very smooth and shiny, without microsculpture, the other intervals with some fine punctures and a very clear isodiametric microsculpture, interval 4 with a large pore in front, and two close together near apex, alongside the raised eighth interval. Pro- and metasternal processes bordered, sides of sterna and base of venter coarsely punctate, apical ventral segment (♀) with two setae on each side.

Allied to *N. interstitialis* Reitt., but differing in some important characters. Head with eight fairly wide and distinct longitudinal carinae between the eyes : in the only example of Reitter's species I have seen, kindly lent to me by Mr. Bänninger, there are only seven rather narrow carinae. Prothorax similar in shape, but more coarsely rugose along base and especially near hind angles. Elytral striae much finer, especially on disk, the sides more densely punctate and shagreened, 8th interval raised into a longer and stronger ridge near apex, the two apical pores close together within it, whereas in *interstitialis* the front one is placed further forward and nearer the middle, approximately on stria 3.

From the only other known Indian species, *N. orientalis* Chaud., it will easily be distinguished by its much darker colour and nearly obsolete dorsal striae.

Gori Valley, 7,000', one ex. ♀.

Carabus wagae Fairm., Ann. Soc. Ent. Fr. 1882, 65.

Length : 18.0-21.0 mm.

Black : joint 1 of antennae very dark red, marginal channel of elytra behind

shoulder and a smooth area surrounding each of the tubercles in the primary intervals and at sides cupreous.

Head wide, not contracted behind eyes, neck somewhat dilated, genae inconspicuous, lateral impressions vague on front but deep on the clypeus, which is emarginate in front and depressed at middle, two vague sulci behind converging on vertex, a small rounded pore between them, some irregular striation near eyes, back of vertex with a few punctures, neck vaguely vermiculate-rugose; mandibles long, curved, and sharp, labrum with the side lobes diverging in front, and a deep semicircular depression between them, mentum with a comparatively short, sharp tooth, the surface behind it raised into a smooth, rounded boss, submentum glabrous, palpi with apical joint strongly dilated, labials bisetose, antennae short and thick, undersurface smooth. *Prothorax* slightly convex, a fourth wider than head, and as much wider than long, both extremities emarginate, base widely, apex more deeply and on its median part only, latter also bordered and densely fringed with hairs, strongly declivous at sides to the angles, which are right and very little rounded, sides bordered and rather vaguely crenulate behind, slightly rounded in front and barely sinuate behind, two marginal setae, one at two-fifths from apex, the other well in front of base, the hind angles a little acute but not sharp, projecting downwards and backwards; median line fairly deep, basal foveae represented on each side by a shallow rounded pore, surface rather shallowly vermiculate-rugose, with vague indications of puncturation, chiefly near margins. *Elytra* ovate, convex, widest rather behind middle, two-thirds wider than prothorax and half as wide again as long, shoulders almost obsolete, sides with a fine border, not much reflexed, very slightly sinuate before apex in both sexes; striae narrow and consequently not deep, with a suggestion of fine puncturation, a little more evident near suture, where the striae are a little nearer together, intervals extending to near apex, secondaries and tertiaries narrow and similar, primaries half as wide again, each broken up, a little irregularly, by about a dozen punctures, each one as wide as the interval and with a tubercle in front of it, an irregular fourth primary, extending from a third to five-sixths, lying between the row of tuberculate punctures beyond the outmost tertiary and the marginal channel, surface near apex very uneven, and, as also along margins, with some minute tubercles; epipleurae smooth, irregularly canaliculate at base. Underside smooth, uneven along sides of venter, prosternum depressed in middle, its process slightly bordered at sides, setose at apex, metepisterna as wide as long, last ventral segment with 2 to 4 setiferous pores on each side in both sexes; protarsi ♂ with 3 dilated joints, but joint 4 is much wider than long, meso- and metatibiae grooved.

*C. waga*e differs from *C. sanchari* as follows. Head only vaguely rugose, joints 3 and 4 of antennae not constricted at base, palpi more rounded at apex; prothorax much smoother, more contracted in front, the front angles more depressed, the border a little narrower; elytra smoother and more regularly sculptured, the primary intervals relatively wider and with much more obvious catenulations, the surface at sides and behind only faintly asperate.

Matoli, Girthi Valley, 14,500', many ex.

Coryza semirubra sp. nov.

Length: 3.75-4.5 mm.

Black: basal half of elytra red; underside, profemora, and apical joints of

antennae more or less piceous; mandibles, legs, and sometimes venter ferruginous; palpi, basal joints of antennae, and tarsi more or less flavous.

Head with the characteristic central carinae, raised in front, where there is an elongate tubercle on each side of the central one, clypeus quadridentate, the median part deeply emarginate, the lateral teeth placed a little behind it, frontal plates bordered, subangulate at sides, raised into a boss and longitudinally sulcate, an oblique lateral carina on each side of vertex, irregularly pitted behind, neck with a deep punctulate constriction, eyes prominent, enclosed by the genae, antennae short, moniliform. *Prothorax* convex, half as wide again as head, but only a little wider than long, widest behind middle, base with a punctate constriction, sides rounded, narrowly bordered, bisetose, with an evident tooth behind; median line deep, front transverse impression fairly deep, punctulate, not reaching front border, surface smooth. *Elytra* moderately convex, not quite a half wider than prothorax and about as much longer than wide, shoulders dentate; striae punctate, fairly deep, especially on disk, 1 to 4 not conspicuously joining at base, intervals convex, very convex but not carinate near apex, 3 quadripunctate, the punctures practically in stria 3. Prosternal process unbordered, connected with prosternum by a narrow ridge, in front of which is a triangular depression, venter punctate and setulose, the two pores on each side of last segment moderately distant, mesotibiae without spur.

A little larger than *C. maculata* Nietn., and easily recognizable by the red basal half of the elytra. The head is more strongly sculptured, though similar in pattern, the front angles of the prothorax projecting further forward, the teeth both at the base of prothorax and on the shoulders of the elytra more evident.

Sarju Valley, 5,000', one ex.

Mr. Champion had previously taken a number of examples in the Upper Gumti Valley, at Ranikhet, and in the Swal River basin, Almora; also at Tanakpur and along the Nandhaur River at Haldwani. Other specimens in the collection of the Forest Research Institute at Dehra Dun were taken at Dwarahat, 5,000', and Kanarichina, 4,000', Almora (*R. N. Parker*); Saiya, 3,600' (*Dr. M. Cameron*); and Binal Gad, 3,500' (*S. N. Chatterjee*), Chakrata; Kali Gad near Dehra Dun (*Dr. M. Cameron*); Kolhu Khet Gad at Mussoorie (*Dr. M. Cameron*); and on the Aglar River, Tehri Garhwal (*Dr. M. Cameron*).

Bembidium persephone sp. nov.

Length: 6.0-7.0 mm.

Piceous: upper surface dull bronze, tibiae dark red.

Head with single, fairly deep, short, wide parallel furrows, extending on to sides of clypeus, neck wide, eyes rather flat, antennae rather thick, not quite reaching middle of elytron, surface smooth. *Prothorax* cordate, rather flat, a third wider than head, and as much wider than long, extremities equally contracted, apex slightly emarginate and bordered close to angles, sides gently rounded and sinuate at a fourth from base, hind angles sharp and rectangular, with a short carina: median line rather deep, not nearly reaching extremities, foveae wide and not very deep, surface smooth, basal area irregularly rugose-

striate. *Elytra* flat, a little depressed on front of disk, shoulders very square, gently dilated behind and widest at apical third, border reaching stria 5; striae shallow, finely punctate, only a little shallower at sides and behind, 2 equally impressed throughout, joining 1 at apex, 8 joining 9 in front, scutellary striae moderately long, apical stria fairly deep, joining 7; intervals nearly flat, 3 with two well-marked pores, at a third and three-fourths, adjoining stria 3, surface smooth. Microsculpture distinct, the meshes of the reticulation a little wider than long. Underside smooth. Metasternal process depressed across middle, distinctly bordered at sides, but not at apex.

Nearly allied to *B. pluto* Andr., but of a brighter bronze colour, rather larger, and flatter. Head with longer antennae, prothorax with deeper median line, a more evident carina in the angles (though this character, generally wanting or rudimentary, is sometimes quite visible in *pluto*), the basal area a little less rugose, elytra flatter, depressed on disk, striae a little deeper, more strongly punctate and less regular. Both this species and *pluto*, which was described as a *Testediolum*, do not quite fit into any of the palaearctic groups, though they approach *Plataphus* more nearly than any other.

Shelshel, 15,750', several ex.

Bembidium eurydice sp. nov.

Length 4.75-5.0 mm.

Piceous beneath, venter pale brown; head and prothorax dark metallic green, elytra dark blue; joints 1 and 2 of antennae, with basal half of 3 and 4, and the whole of the palpi and legs pale flavous, rest of antennae fuscous.

Head with single, deep, parallel furrows, extending on to clypeus, eyes prominent, antennae fairly thick and long, reaching middle of elytra, surface impunctate. *Prothorax* rather small, cordate, moderately convex, a little wider than head and a third wider than long, base barely wider than apex, sides rather strongly rounded in front and sinuate at a fourth from base, hind angles right, sharp, and projecting a little laterally, with a small carina; median line fine, widening into a shallow furrow close to base, front transverse impression shallow, hind one fairly deep, foveae small but distinct, surface smooth, the whole basal area rugulose. *Elytra* convex, ovate, not quite twice as wide as prothorax and not quite a half longer than wide, sides strongly rounded, basal border very short, between striae 5 and 6, meeting side border at a sharp angle; striae punctate-striate, fairly deep, a little shallower at sides, especially 7, 1-2-8 all fairly deep near apex, 8 joining 9 in front, scutellary striae not very long, apical stria moderately deep, joining 5; intervals moderately convex, 1 very narrow near apex, 3 with two pores at a third and two-thirds, adjoining stria 3. The microsculpture of the elytra consists in extremely fine transverse lines, visible when magnified by 75 diameters; on the head and prothorax there is a reticulation, the meshes of which are mostly wider than long. Underside glabrous, metasternal process unbordered.

The species will not fit into any Palaearctic group, but the angular border at shoulder and the microsculpture bring it very near to *B. clarum* Andr. It differs chiefly in having longer an-

tennae, a prothorax with sides sinuate further from base, elytra with deeper striation and much more rounded sides.

Gori River Gorge, 5-9,000', two ex.

Bembidium charon sp. nov.

Length : 3.5-4.0 mm.

Dark brassy above, piceous beneath ; joints 1 and 2 of antennae, with basal half of 3 and 4, base of palpi, and legs ferruginous ; rest of antennae and penultimate joint of palpi fuscous.

Head with single furrows, diverging a little behind and extending on to clypeus, neck wide, eyes rather flat, antennae short, submoniliform, surface smooth. *Prothorax* convex, cordate, a fourth wider than head and a third wider than long, apex very clearly bordered at sides, a shade wider than base, sides gently rounded and sinuate near base, hind angles sharply rectangular, with a distinct carina ; median line moderately impressed, base depressed, the foveae fairly deep, a few coarse punctures along front and side margins, basal area coarsely rugose-punctate. *Elytra* convex, oval, nearly two-thirds wider than prothorax, and a half longer than wide, shoulders obsolete, a narrow reflexed border which at base just reaches stria 5 by a re-curved vestige of the basal border ; the striae are punctate and fairly deep on disk, but much effaced at sides and apex, 1 and 8 only reaching apex, with traces of 2 apparently joining 1, 8 joining 9 near base, scutellary striole very short, apical stria deep, joining 7 ; intervals moderately convex on disk, flat at sides, 3 with 2 large pores at a third and two-thirds adjoining stria 3, surface smooth. No microsculpture. Underside smooth, metasternal process with only a suggestion of a border.

Very near *B. radians* Andr., but a little smaller and differing as follows. Head impunctate, the frontal furrows clearly diverging behind ; prothorax with some punctures along front margin, more contracted behind, so that base is slightly narrower than apex (wider in *radians*) ; elytra oval, the shoulders quite cut away.

Gori River Gorge, 5-9,000', five ex. Burphu, in the Gori Valley, 11,500', one ex.

Trichotichnus liparus sp. nov.

Length : 9.0-10.0 mm.

Black, very shining ; apical border of elytra and mandibles (except apex) dark red ; palpi, antennae, and legs flavous.

Head convex, smooth, frontal foveae small, continued obliquely towards eye, suture fine, eyes prominent, palpi slender, tapering to apex, antennae rather short. *Prothorax* moderately convex, quadrate, not quite half as wide again as long, base truncate, wider than apex, which is a little emarginate, the front angles rounded, sides narrowly bordered, moderately rounded in front, straight behind, the hind angles sharp but slightly obtuse ; median line fine, front transverse impression slight, hind one more distinct, basal foveae moderately impressed, the whole basal area finely rugose-punctate, the punctures extending forward along marginal channel, surface elsewhere smooth. *Elytra* convex, ovate, a third wider than prothorax and about half as long again as wide, widest rather behind middle, sides with a narrow reflexed border, slightly emarginate before apex ; striae impunctate, very clearly incised and deep near apex, scutellary striole moderately long, intervals rather flat, except near apex,

3 with a small pore (sometimes absent) at apical third, adjoining stria 2, surface smooth and glossy, but with a microsculpture of very fine and closely-placed lines, just visible under a magnification of 75 diameters. Prosternal process setulose, metepisterna half as long again as wide, venter punctate and setulose, last segment ♂ with 1 seta on each side, ♀ with two, tarsi fringed with long hairs, joint 5 setulose beneath.

The generic characters agree very well with those of the genus *Trichotichnus* Morawitz, as re-defined by Tchitcherin, except for the setulose ventral surface. Very similar in form to *T. lamprinus* Bates, from Ceylon, but a little larger and, if anything, more shiny. Head with more prominent eyes, prothorax less contracted behind, the base rather more rugose, the elytra much less deeply striate and the intervals consequently flatter.

Gori River Gorge, 5-9,000', one ex. Some other specimens had already been taken by Mr. Champion in the West Almora division, the Nainital division at 7-8,600', and in the Sunderdhunga Valley, 8-12,000'.

Amara (Niphobles) splendens sp. nov.

Length : 8.0-9.0 mm.

Dark bronze above, piceous beneath ; palpi, antennae and legs piceous red.

Head wide, frontal furrows fairly deep, clypeus emarginate, unbordered, eyes not prominent, two supra-orbital setae, tooth of mentum not emarginate, surface smooth. *Prothorax* moderately convex, half as wide again as long, base truncate, much wider than apex, which is somewhat emarginate, sides gently rounded in front, nearly straight behind, with a narrow reflexed border, hind marginal seta just within the angle, which is practically right and fairly sharp ; median line fine, basal foveae well marked, inner one deeply impressed, outer one shallower, bounded outwardly by an oblique carina, surface smooth but a little uneven, the foveae rather densely punctate, middle of base finely longitudinally striate. *Elytra* ovate, moderately convex, a third wider than prothorax, and about half as long again as wide, widest at middle ; striae rather shallow, and hardly deeper near apex, finely punctate, 2 without any pore at base, 5 generally deeper close to base, scutellary striae fairly long, intervals flat, surface smooth. Prosternal process glabrous, feebly bordered throughout or with a narrow border at apex, metasternal process widely bordered, metepisterna twice as long as wide, moderately punctate, as are sides of metasternum and basal ventral segments, apical segment with two setae on each side in both sexes.

♂ shiny, with a faint microsculpture, the meshes a little wider than long, mesotibiae with two strong teeth on inner margin of apical half, metatibiae curved and densely fringed with hairs on inner margin.

♀ dull, the microsculpture similar to that of the ♂, but much more strongly impressed.

Milam, 11,500', and Burphu, 11,500', both in the Gori Valley ; Girthi Valley, 14,000' ; Sheshel, 15,750'. Many ex. There are also some specimens in the collection of the Forest Research Institute, Dehra Dun, taken in the Yangti Valley, 14,400' (R. N. Parker).

The species, though resembling in some of its characters both *Bradytus* and *Leirides*, will not fit into either of them, and I therefore with some reluctance suggest a new subgenus *Niphobles*, characterized by a glabrous and feebly bordered prosternal process, the prosternum without a punctate impression, the margin of the clypeus unbordered and unthickened, the metepisterna elongate and punctate, ♂ with mesotibiae inwardly bispinose and metatibiae inwardly fringed with dense hairs. The two supraorbital setae and the two setae on each side of last ventral segment in both sexes may not prove constant when other species of the subgenus are discovered.

Amara (Cumeres) thalia sp. nov.

Length : 6.50-7.25 mm.

Piceous : underside of head and prothorax, side borders of latter, apical border of elytra, palpi, antennae, and legs reddish. Some specimens (probably immature) are paler, with the legs and antennae flavous.

Head convex, smooth, frontal impressions small but fairly deep, as is the clypeal suture, eyes very flat, antennae fine, submoniliform toward apex. *Prothorax* moderately convex, half as wide again as long, extremities truncate, sides narrowly bordered and evenly rounded from base to apex, hind angles obtuse but evident ; median line very fine, inner foveae short, parallel, linear, fairly deep, a transverse impression across base between them, outer foveae obsolete, base with some faint puncturation at sides and equally faint longitudinal striation at middle, surface generally smooth. *Elytra* oval, somewhat depressed, a little wider than prothorax and about a half wider than long, the border forming a sharp angle at shoulder ; striae clearly cut, but not deep even at apex, very finely crenulate rather than punctate, intervals flat, surface smooth, with an isodiametric microsculpture, which is more marked in the ♀, so that in this sex the surface is duller than in the ♂. Prosternal process bordered, metepisterna a little longer than wide, with traces only of puncturation, ♂ with one seta, ♀ with two setae on each side of last ventral segment.

This is the second species belonging to the subgenus *Cumeres* Andr. (Mission Babault, Carab., 1924, 98). It is smaller, flatter and rather duller than *A. lamia*, but in other respects similar in shape. Clypeal suture rather deeper, eyes flatter, hind angles of prothorax rather more rounded, elytra less rounded at sides and appearing therefore a little less contracted at base, the striation not quite so deep, ♂ with only one seta on each side of apical ventral segment.

Supi River, Tibet, 15,000', several ex. A solitary example, rather larger than the others, was also taken at Milam, Gori Valley, 11,500'.

Pterostichus (Steropus) championi sp. nov.

Length : 1.50-1.70 mm.

Black : elytra blue-black to deep purple, apical joints of antennae, palpi, and tarsi piceous.

Head wide, frontal furrows deep, diverging and bifurcating behind, eyes rather small and enclosed by genae behind, mandibles long, antennae short and thick. *Prothorax* convex, nearly a third wider than long, both extremities slightly emarginate, base rather narrower than apex, sides rounded but more contracted behind than in front, a fairly thick, slightly reflexed border, which turns the front angles and continues a short distance along front margin, a seta at apical third and another just before hind angle, which is visible, though very obtuse; median line distinct, not reaching base, sometimes with a rounded puncture on each side near base, foveae linear, short but rather deep, diverging slightly in front, not nearly reaching base or affecting the even convexity of the surface generally, which is practically smooth throughout. *Elytra* convex, ovate, a fourth wider than prothorax and three-fifths longer than wide, widest a little behind middle, base bordered, sides reflexed, with a deep emargination near apex; striae deep, very deep behind, impunctate, scutellary striae short and oblique, between 1 and 2, intervals convex, 4 and 6 ending at some distance from apex, 3 with three (sometimes four) pores, first adjoining stria 3, second and third adjoining stria 2, a narrow raised line extending from middle of elytron to apical emargination between interval 9 and marginal channel, surface smooth with a microsculpture of isodiametric meshes. Metepisterna as wide as long; joint 1 of meso- and metatarsi outwardly grooved, joint 5 without setae beneath. ♂ with the three first joints of protarsi widely dilated; apical ventral segment not tuberculate, but depressed in middle and minutely rugose.

The absence of setae on tarsal joint 5 would place the species near *P. illigeri* Panz., to which it bears little resemblance. In size and colour it is very much like *P. harmandi* Tchitch. from Sikkim, but with the characters of a *Steropus*, and indeed the only species belonging to that group at present known from the Himalayas.

Gori Vallev, 7,000', two ex. Mr. Champion had previously taken other examples in the Sunderdhunga Valley, 8-12,000', and in the Pindar Valley, 8-11,000'. There are also two examples in the Indian Museum labelled 'Garhwal, Painsur, above Lohba, 8,000' (Tytler).'

Calathus atrema sp. nov.

Length: 10.0-12.0 mm.

Black: apical border of elytra, palpi, antennae, tibiae, tarsi, and apex of femora reddish.

Head small, convex, neck faintly constricted, frontal furrows small and rounded, eyes not projecting beyond genae, which slope gradually to neck, antennae rather long and, like the palpi, very slender, mentum with a wide emarginate tooth, surface smooth, vertex and sides of front with some faint transverse striation. *Prothorax* rather convex, quadrate, as long as wide, extremities truncate, bordered at sides, base clearly wider than apex, sides very narrowly bordered, gently rounded in front and equally gently sinuate behind, the hind angles right and slightly reflexed; median line fine, basal foveae deep but wide, surface vaguely striate, a little uneven in the foveae. *Elytra* convex, ovate, nearly a half wider than prothorax, and a third longer than wide, border reflexed, angulate at shoulder, not sinuate behind; striae fairly deep, vaguely crenulate, shallower at sides and apex, scutellary striae short and fine, intervals moderately convex, 3 impunctate, surface smooth. Prosternal process unbordered, metepisterna as wide as long, smooth, last

The species, though resembling in some of its characters both *Bradytus* and *Leirides*, will not fit into either of them, and I therefore with some reluctance suggest a new subgenus *Niphobles*, characterized by a glabrous and feebly bordered prosternal process, the prosternum without a punctate impression, the margin of the clypeus unbordered and unthickened, the metepisterna elongate and punctate, ♂ with mesotibiae inwardly bispinose and metatibiae inwardly fringed with dense hairs. The two supraorbital setae and the two setae on each side of last ventral segment in both sexes may not prove constant when other species of the subgenus are discovered.

Amara (Cumeres) thalia sp. nov.

Length : 6.50-7.25 mm.

Piceous : underside of head and prothorax, side borders of latter, apical border of elytra, palpi, antennae, and legs reddish. Some specimens (probably immature) are paler, with the legs and antennae flavous.

Head convex, smooth, frontal impressions small but fairly deep, as is the clypeal suture, eyes very flat, antennae fine, submoniliform toward apex. *Prothorax* moderately convex, half as wide again as long, extremities truncate, sides narrowly bordered and evenly rounded from base to apex, hind angles obtuse but evident ; median line very fine, inner foveae short, parallel, linear, fairly deep, a transverse impression across base between them, outer foveae obsolete, base with some faint puncturation at sides and equally faint longitudinal striation at middle, surface generally smooth. *Elytra* oval, somewhat depressed, a little wider than prothorax and about a half wider than long, the border forming a sharp angle at shoulder ; striae clearly cut, but not deep even at apex, very finely crenulate rather than punctate, intervals flat, surface smooth, with an isodiametric microsculpture, which is more marked in the ♀, so that in this sex the surface is duller than in the ♂. Prosternal process bordered, metepisterna a little longer than wide, with traces only of puncturation, ♂ with one seta, ♀ with two setae on each side of last ventral segment.

This is the second species belonging to the subgenus *Cumeres* Andr. (Mission Babault, Carab., 1924, 98). It is smaller, flatter and rather duller than *A. lamia*, but in other respects similar in shape. Clypeal suture rather deeper, eyes flatter, hind angles of prothorax rather more rounded, elytra less rounded at sides and appearing therefore a little less contracted at base, the striation not quite so deep, ♂ with only one seta on each side of apical ventral segment.

Supi River, Tibet, 15,000', several ex. A solitary example, rather larger than the others, was also taken at Milam, Gori Valley, 11,500'.

Pterostichus (Steropus) championi sp. nov.

Length : 1.50-1.70 mm.

Black : elytra blue-black to deep purple, apical joints of antennae, palpi, and tarsi piceous.

Head wide, frontal furrows deep, diverging and bifurcating behind, eyes rather small and enclosed by genae behind, mandibles long, antennae short and thick. *Prothorax* convex, nearly a third wider than long, both extremities slightly emarginate, base rather narrower than apex, sides rounded but more contracted behind than in front, a fairly thick, slightly reflexed border, which turns the front angles and continues a short distance along front margin, a seta at apical third and another just before hind angle, which is visible, though very obtuse; median line distinct, not reaching base, sometimes with a rounded puncture on each side near base, foveae linear, short but rather deep, diverging slightly in front, not nearly reaching base or affecting the even convexity of the surface generally, which is practically smooth throughout. *Elytra* convex, ovate, a fourth wider than prothorax and three-fifths longer than wide, widest a little behind middle, base bordered, sides reflexed, with a deep emargination near apex; striae deep, very deep behind, impunctate, scutellary striae short and oblique, between 1 and 2, intervals convex, 4 and 6 ending at some distance from apex, 3 with three (sometimes four) pores, first adjoining stria 3, second and third adjoining stria 2, a narrow raised line extending from middle of elytron to apical emargination between interval 9 and marginal channel, surface smooth with a microsculpture of isodiametric meshes. Metepisterna as wide as long; joint 1 of meso- and metatarsi outwardly grooved, joint 5 without setae beneath. ♂ with the three first joints of protarsi widely dilated; apical ventral segment not tuberculate, but depressed in middle and minutely rugose.

The absence of setae on tarsal joint 5 would place the species near *P. illigeri* Panz., to which it bears little resemblance. In size and colour it is very much like *P. harmandi* Tchitch. from Sikkim, but with the characters of a *Steropus*, and indeed the only species belonging to that group at present known from the Himalayas.

Gori Valley, 7,000', two ex. Mr. Champion had previously taken other examples in the Sunderdhunga Valley, 8-12,000', and in the Pindar Valley, 8-11,000'. There are also two examples in the Indian Museum labelled 'Garhwal, Painsur, above Lohba, 8,000' (Tytler).'

Calathus atrema sp. nov.

Length: 10.0-12.0 mm.

Black: apical border of elytra, palpi, antennae, tibiae, tarsi, and apex of femora reddish.

Head small, convex, neck faintly constricted, frontal furrows small and rounded, eyes not projecting beyond genae, which slope gradually to neck, antennae rather long and, like the palpi, very slender, mentum with a wide emarginate tooth, surface smooth, vertex and sides of front with some faint transverse striation. *Prothorax* rather convex, quadrate, as long as wide, extremities truncate, bordered at sides, base clearly wider than apex, sides very narrowly bordered, gently rounded in front and equally gently sinuate behind, the hind angles right and slightly reflexed; median line fine, basal foveae deep but wide, surface vaguely striate, a little uneven in the foveae. *Elytra* convex, ovate, nearly a half wider than prothorax, and a third longer than wide, border reflexed, angulate at shoulder, not sinuate behind; striae fairly deep, vaguely crenulate, shallower at sides and apex, scutellary striae short and fine, intervals moderately convex, 3 impunctate, surface smooth. Prosternal process unbordered, metepisterna as wide as long, smooth, last

ventral segment with one seta on each side in both sexes, joints 1 and 2 of metatarsi outwardly sulcate. ♂ with the microsculpture of the elytra rather faint, the meshes irregular, but on average transverse: ♀ duller than ♂, with a very clear microsculpture of isodiametric meshes.

Most nearly allied to *C. himalayae* Bates. Eyes less prominent, prothorax narrower, gently but evidently sinuate behind, sides less explanate and reflexed behind, striation of elytra fainter at sides and apex, scutellary striole shorter, interval 3 impunctate. The absence of pores on interval 3 is very unusual in the genus, but occurs also in *C. pectiniger* Putz., which I believe to be synonymous with *Pristosia picea* Motsch.

Gori River Gorge, 5-9,000'; Burphu, Gori Valley, 11,500'.

Other specimens were taken previously by Mr. Champion in the Pindar Valley, 8-11,000', and in the Sunderdhunga Valley, 8-12,000'.

Anchomenus viridicans sp. nov.

Length: 11.0-12.0 mm.

Black: upper surface, especially elytra, with a faint bluish or greenish tinge; palpi, antennae, and legs more or less piceous.

Head convex, small but elongate, neck very constricted, frontal furrows fairly deep, curving outwards to eye, a rounded depression on each side of vertex, eyes rather flat and hardly projecting beyond genae, which slope gradually backwards to neck, antennae long and slender, pubescent from joint 4, 3 hardly longer than 4, palpi very slender, mentum with a wide emarginate tooth, surface smooth. *Prothorax* moderately convex, much wider than head, but very little wider than long, equally contracted at extremities, base truncate, apex somewhat emarginate, front angles projecting a little but rounded, sides strongly rounded, very vaguely sinuate near hind angles, widely explanate and reflexed, front marginal seta rather before middle in the marginal channel, hind one wanting, hind angles reflexed, obtuse, and a little rounded; median line deep in front, transverse impressions moderate, basal foveae rather deep and rounded, within the reflexed hind angles, their surface vaguely and minutely rugose-punctate, surface otherwise smooth. *Elytra* moderately convex, oval, two-thirds wider than prothorax and fully half as long again as wide, rounded behind, sides moderately reflexed, without sinuation before apex; striae impunctate, very clearly cut and moderately deep, a little shallower near apex, 1, 2, 7, and 8 reaching apex, 3 and 4 joining somewhat before apex, 5 and 6 a little further back, scutellary striole rather short, intervals nearly flat, 3 with 3 pores, front one adjoining stria 3, the two hind ones adjoining stria 2, surface smooth and shiny, though with a microsculpture of fine transverse lines, similar in the two sexes. *Prosternal process* unbordered, without keel, metepisterna half as long again as wide, last ventral segment ♂ with one seta, ♀ with two setae on each side; protarsi with joint 4 moderately emarginate, meso- and metatarsal joints bisulcate.

Recalling *Colpodes eulabes* Bates, but more nearly allied to *A. caesiti* Andr. Compared with the latter the elytra, both in form and colour, are similar, though the striae are more evident at sides and near apex, the prothorax is longer, with the sides much more

widely explanate and reflexed, the hind angles less rounded, the front ones much more prominent.

Gori Valley, 7,000', three ex.

In the genus *Colpodes* the prothorax has sometimes two marginal setae, sometimes the hind one is wanting, and occasionally both have disappeared. In all the European species of *Anchomenus* I think both setae are present, but the hind one is absent in several Himalayan species which I have recently described, viz. *A. caesitius*, *eurous*, *benardi* and *relucens*, while in *A. comatus* Andr. four or five setae are present. The tooth of the mentum is somewhat variable in *Colpodes*, but always simple in the European species of *Anchomenus*, whereas in some Himalayan species at least it is wide and grooved, and in the species described above frankly emarginate. There remain, however, so many Indian species still to examine and describe that I treat it at present as an *Anchomenus*, pending a revision of the Oriental species generally.

Cymindis alticola sp. nov.

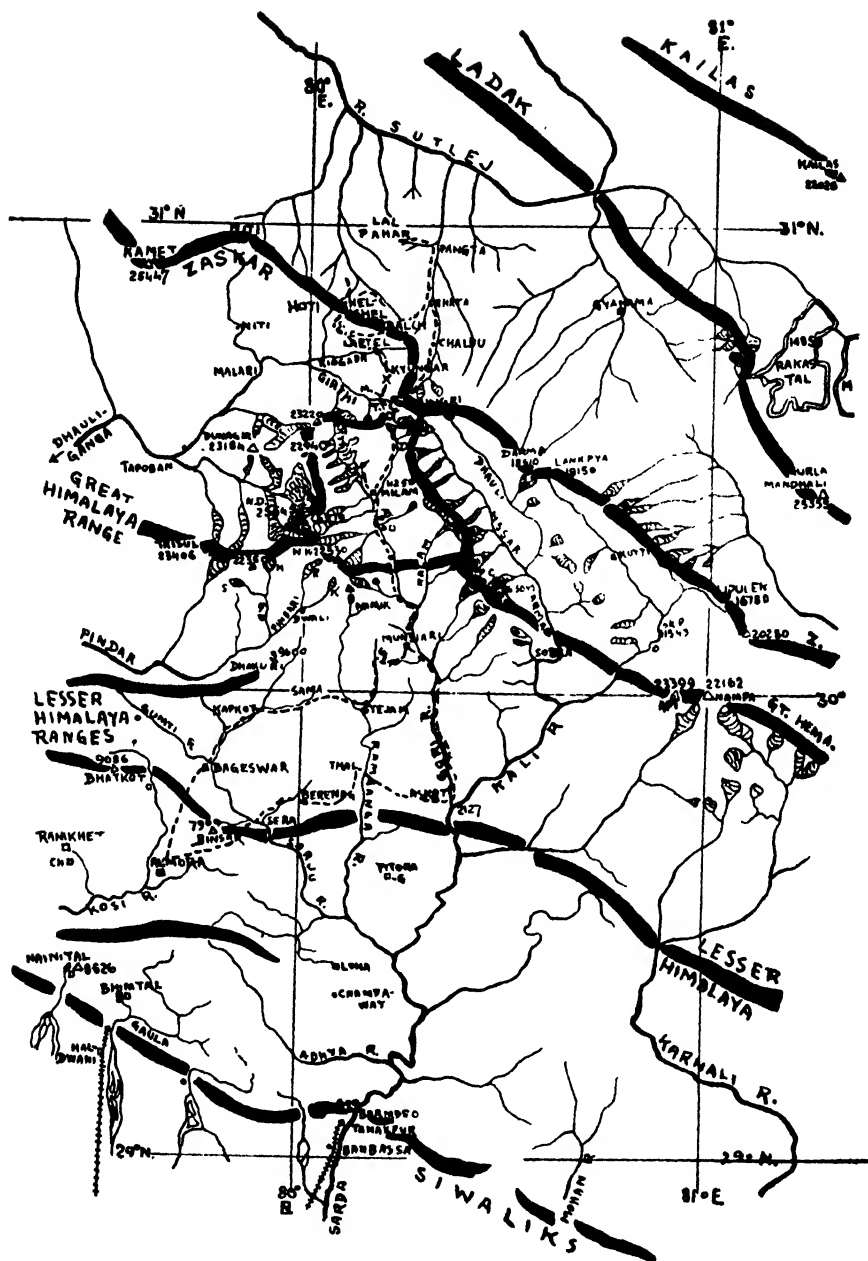
Length: 9.0-11.0 mm.

Piceous, shiny; side margins of prothorax in front, side and apical margins of elytra, an elongate humeral spot on intervals 5-7, a third as long as elytron, legs, base of antennae, metasternum, and middle of venter testaceous; palpi, rest of antennae and undersurface brownish.

Head convex, fairly wide, neck slightly constricted, frontal foveae smooth and rounded eyes moderately prominent, though hardly projecting beyond genae, which slope gradually to neck, antennae reaching basal fourth of elytron, joint 3 sparsely pubescent, apical joint of palpi truncate, in labials ♂ slightly dilated, surface punctate along sides and across vertex. *Prothorax* moderately convex, a fourth wider than head, and a half wider than long, sides strongly rounded in front, somewhat explanate and reflexed, sharply contracted behind, so that base is a little narrower than apex, hind angles reflexed and projecting laterally as a sharp rectangular tooth; median line and transverse impressions obsolete, basal foveae rounded, adjoining angles, surface moderately punctate, sparsely on disk. *Elytra* flat, nearly two-thirds wider than prothorax and half as long again as wide, apex truncate, the elytra separately rounded, basal border entire; striae moderately impressed, very finely punctate, intervals flat, rather finely and not very closely punctate, the punctures in single irregular rows on inner intervals, quite irregularly placed at sides. Microsculpture of elytra isodiametric, entirely wanting on head and prothorax.

In coloration not unlike *C. humeralis* Geoffr., but with a longer shoulder stripe. More nearly allied to *C. habaulti* Andr. from Kashmir, but with much longer and flatter elytra and a shorter shoulder stripe, the hind angles of prothorax projecting as a larger, sharper tooth, the striae of elytra deeper, the intervals less closely punctate.

Laptel, 15,000'; Shelshel, 15,750'. Tibet, Supi River, 15,000'. Many ex.



Map of a portion of Kumaon, United Provinces, and the adjacent Tibetan region north of the Indian frontier. The dotted line shows Mr. H. G. Champion's route from Almora, Kumaon, to Lal Pahar, Tibet, June 16th to August 28th, 1924. The locality B, below Milam, = Burphu.

8 North Grove, Highgate, N.6.
January 1st, 1926.

ADDITIONAL REMARKS UPON *BOREUS HYEMALIS* L.

BY C. L. WITHYCOMBE, PH.D., M.SC., F.E.S.

In November and December, 1921, after submitting my paper upon *Boreus hyemalis* to the Entomological Society of London (5), the following additional observations were made upon this insect, and they have remained in note form until the present time. A projected paper upon the morphology of *Boreus* has not materialised and is unlikely to do so in the near future; therefore, as the following observations contribute some facts to our knowledge of the biology of this curious insect, they are offered in their present disconnected form.

The food of the larva was found to consist of moss, living and decayed. In Epping Forest a preference is shown for *Mnium hornum*, but *Dicranella heteromalla* and *Bryum atropurpureum* are also taken. Elsewhere the larvae have been observed to feed upon liverworts.

The adult food is apparently small in quantity, and imagines, if kept moist, live for from one to three weeks seemingly without food. If they kept too dry they die rapidly, and in such condition they will often lap at anything moist. The case of a female quoted on page 314 (5) as feeding upon the eviscerated juices of a fly is probably to be accounted for in this manner. I am now convinced that the insect would not have accepted such food had the conditions in my cages been more favourable and had natural food been available.

Brauer (1) states that apparently the food of the adult is moss, but he adds that possibly the insect feeds upon *Podura* and other small animals in the moss.

In November, 1921, I had placed some fresh and growing *Dicranella heteromalla* moss in a cage with *Boreus*, where previously only withered moss had been. Several of the insects were later observed feeding. They bruised the bases of the moss leaves with their mandibles and continued to do this for periods of a minute or two at a time (5, p. 318). Little damage was done to the moss and little food could have been obtained upon each occasion, but further observations show that such is the normal food of the insect, scanty though it be. Unlike all other Mecoptera, therefore, *Boreus* is a vegetable feeder throughout life and, although in captivity other food may be taken when starving, its food in nature is mainly derived from the same moss as that in which the larval stages have been passed.

The male *Boreus* possesses two pairs of stiff bristle-like wings, curved backwards over the fore part of the abdomen. The hindwings are weaker than the forewings and lie closely applied to the latter, each in a groove, so that they are not easily visible. The margins of the forewings bear many short, stiff bristles. Mid-dorsally on the second abdominal segment is a short, transverse, ridge-like process, directed forwards, and there is another, but very slight, ridge in a similar position to the third abdominal segment. The genital claspers of the male (gonopods) are upwardly directed and fold forwards dorsally. Each terminates in two prongs, the smaller one of which is inwardly directed.

The female has none of these structures and is almost wingless; there is a pair of scale-like lobes on the mesothorax.

When about to pair the male runs alongside the female and then, with a sudden backward and sideways movement, passes his raised wings over the body of the female, about her middle. His abdomen passes below that of the female, and the apex, curled upwards and forwards, is used to push the female into such position that the wings obtain a complete hold.

With the female held thus, between the wings and the ridges upon the dorsa of segments two and three, the male pulls to lift the female off her legs. In this he is not always successful, although generally so, and the female is then carried helplessly lying across the back of the male. The male runs for some time until the female ceases to struggle, when he stops or moves less rapidly. The abdomen of the male is now brought round to the genitalia of the female. The prongs of each clasper seize and pull down on either side the two sub-genital valves of the ovipositor of the female and finally pairing is effected. Now the male releases hold with the wings and the female rests quiescent, parallel with the body of the male, with forelegs bent and slightly apart so that the male's wings hold to steady the female near the bases of the forelegs. The second and third pairs of legs of the female are folded and closely drawn up to the abdomen. The male thus wanders about on the surface of the ground with the female seated upon his back and appearing lifeless.

In this peculiar insect, therefore, the wings, although rudimentary, are of important function.

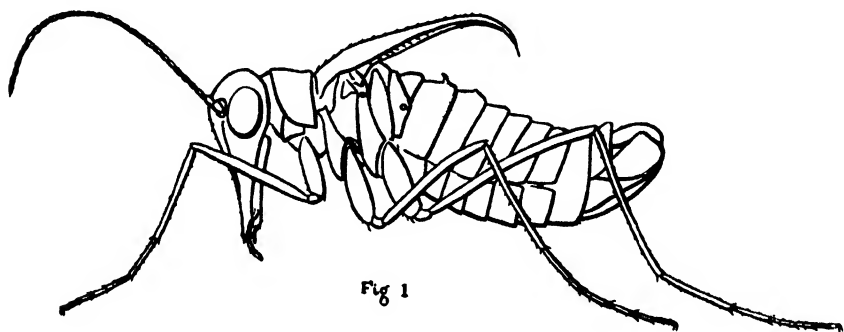
Rambur (3) in 1842 stated that *Boreus* possessed no ocelli. Walker (4) in 1853 repeated this statement, and MacLachlan (2), 1868, gave as one of the characteristics of his family Boreidae the

absence of ocelli. Probably authors before Rambur, to whom I have no reference at present, have done likewise, and certainly many others since, including myself, have accepted and perpetuated the statement.

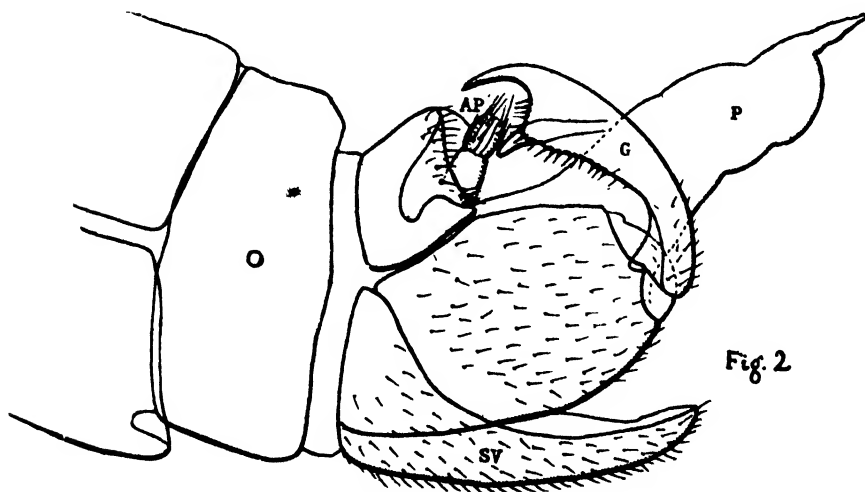
An examination of imagines of *Boreus* shows, however, that such is not the case. Three ocelli are present in this genus as in the rest of the Mecoptera.

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- (1) BRAUER, F., 1863. Verhandl. Zool.-Bot. Ver. Wien, pp. 320-323.
- (2) MACLACHLAN, R., 1868. Trans. Entom. Soc. London, p. 218.
- (3) RAMBUR, M. P., 1842. Hist. Nat. Insectes. Névroptères, p. 327.
- (4) WALKER, F., 1853. Cat. Neuropt. Ins. Brit. Mus., p. 455.
- (5) WITHYCOMBE, C. L., 1921. Trans. Ent. Soc. London, pp. 312-318.



1. *Boreus hyemalis* L. Adult ♂.



2. *Boreus hyemalis* L. Genitalia, ♂.

AP = Anal papilla or proctiger.
G = Clasper or gonopod.

P = Aedeagus.
SV = Sub-genital valve or hypandrium.

STUDIES ON CLYDE CRANE-FLIES :
LARVAL HABITATS OF SOME LOCAL SPECIES.

BY ALEXANDER CUTHBERTSON, C.D.A. (GLAS.).

The following brief account of the habitats of some crane-fly larvae (70) known to the writer in the Clyde area is intended to supply data for the ecologist generally and the entomologist in particular. Comparison with the few records available in the literature (see References) is made in the species studied. The habitat has been discovered by rearing the species several times during the past four years; and where there is doubt, *e.g.* the species having been reared once only, the number (1) is placed after the notes. Precise localities for the habitats are given only in certain species, as further information will be included in a paper containing descriptions of hitherto unknown or inadequately-described immature stages. Alexander (1920, pp. 741-743) gives excellent advice on rearing the larvae of crane-flies.

SOME HABITATS OF LOCAL CRANE-FLY LARVAE.

Ptychoptera albinana F. Shallow places in burns among decaying vegetation, aquatic, Tourgill, Largs (Ayr); or in submerged mud beside burn, Westerton Suburb (Glas.); see Topsent (1914-1916).

P. lacustris Mg. Submerged mud, burn near golf course, Millport (Cumbrae).

P. scutellaris Mg. Mud, as *albinana*, Westerton Sewage Filters (Glasgow).

Trichocera annulata Mg. 'Leaf-mould' beneath surface carpet of deciduous leaves, pine-needles, etc., in open woodland, especially in wet hollows and drains, Garscub Estate, Westerton Garden Suburb (Glasgow).

T. regelationis L. Decaying vegetation, *e.g.* mid-rib of cabbage (*Brassica*); in cattle-dung; decaying reeds (*Phragmites*) in bed of burn, Yoker.

Limonia bifasciata Schrk. Decomposing fungus (*Agaricus*) in open woodland, Autumn 1923, Sprindside Glen, West Kilbride. See de Meijere (1916).

L. flavipes F. Humus soil beside burn, glen at Tourgill, Largs.

L. nubeculosa Mg. Moist humus soil on banks of burns; in wet places in woods in 'leaf-mould.'

L. tripunctata F. Leaf-mould in ditch, Yonderfield Glen, West Kilbride.

Rhipidia maculata Mg. Moist sandy soil at margin of burns; in leaf-mould with *D. autumnalis* Staeg., Newton Wood (Renfrew.); see Beling (1879): cattle-dung.

Dicranomyia chorea Mg. Moss (*Bryum*, *Hypnum*) growing on rock, Spring 1925, Westerton district.

D. didyma Mg. Discussed with *autumnalis* Staeg. in my recent paper on the crane-flies of the Inner Hebrides (Scot. Nat., 1926). *i.e.* wet organic mud.

D. dumetorum Mg. Decayed wood under bark of tree-stump, woods of Cochno (Kilpatrick Hills); Beling (1886): in decaying wood; Winnertz (1853): in decaying beech.

Helius dubius Edwards. Saturated mud from swamp, Frankfield Marsh (Riddrie). Edwards (1921, Trans. Ent. Soc. London, p. 207) records larvae reared from rotten stems of reedmace (*Typha*) by Mr. K. G. Blair. Larvae of

H. longirostris Mg. have been found in submerged stems of water dock (*Rumex aquaticus* L.), see Gercke, 1884.

Idioptera trimaculata Zett. Moist soil beside burns, and hill-drains, glen at Tourgill, Largs.

Limnophila (*Phylidorea*) *ferruginea* Mg. Saturated mud of marshes (*Juncus*) with *Erioptera fuscipennis* Mg., Meikle Kilmory, Isle of Bute; de Meijere (1916, pp. 204-206): between decaying leaves in ditch.

Limnophila lineola Mg. Moist humus soil at margin of burn; reared from mud from Frankfield Marsh, see Beling (1886, pp. 199-200).

L. nemoralis Mg. Soil at roots of grasses (*Aira*) in open woodlands, e.g. Newton Woods (Renfrew); Beling (1873): humus soil as with *Limonia tripunctata*. Also once reared from larvae taken in woodland ditch, Garscadden, near Drumchapel. Beling: leaf-mound in woods, along margins of streams.

L. ochracea Mg. Decomposing wood and detritus on fallen branch, in association with *Tipula irrorata* Mcq. (q.v.); also reared from larvae found in wet drain among leaves at Garscadden. Mr. H. F. Barnes has reared this species from decaying hazel (*Corylus*) in Wales; Beling (1886, p. 202): moist soil.

L. (Pilaria) discicollis Mg. Wet mud and decaying vegetable matter from Possil and Frankfield Marshes. Brauer (1883, p. 54) and Gerbig (1913, pp. 164-166): moist soil between decaying leaves in swamps; Cameron (1917, p. 63) records this species as occurring in decaying wood.

Poecilostola punctata Schrk. Moist sandy soil at margin of burn, Third Part Farm, Yoker; Beling. Gerbig: wet soil, and Cameron (1917, p. 63): decaying wood.

Adelphomyia senilis Hal. Submerged mud in burn, near Fintry Bay, Millport (1).

A. nielseni Kuntze. Reared from larvae found between decaying leaves, Cochno Glen (1).

Pedicia rivosa L. Aquatic mosses in hill-side spring, near Tourgill; among decaying leaves under water in ditch; moist soil beside burns: Beling (1879, p. 45-46) in burns, springs, wet places, with *Tipula fulvipennis* Deg.

Tricyphona claripennis Verr. Water-saturated mosses on rocks beside cascade (1). West Bay, near point, Millport (Cumbrae).

T. immaculata Mg. Moist soil at margin of burns, in association with *Poecilostola punctata*, *Dicranota bimaculata*, *Ormosia lineata*, and others, Third Part, Yoker. Beling (1897, p. 46) found larvae in leaf-mould in bed of dried-up burn, and in cattle-dung; de Meijere (1916, pp. 195-196): leaf-mould.

Dicranota bimaculata Schum. Sand and gravel under water in mid-stream, Westerton; moist soil at margin, Yoker. Miall (1893): sand or mud and gravel in streams and ponds.

D. guerini Zett. Sand and gravel in burn, Yonderfield glen; sand in burn at Meikle Kilmory, June 1925.

Ilisia areolata Siebke. Sand on banks of burn at Third Part Farm, Yoker, at roots of grasses, willow-herb (*Epilobium*), Valerian, etc.

I. maculata Mg. Reared from larvae taken in ditch at Tourgill, glen by the high-road; Beling (1879, p. 49): under leaves in woods.

Empeda flava Schum. Adult emerged from lot of *Erioptera* larvae found in sand at Westerton Sewage Filters (1).

E. nubila Schum. Under surface carpet of leaves, pine-needles, etc., in leaf-mould in rather dry woods.

Erioptera flavescens Mg. Moist humus soil at margin of burns, Tourgill. Beling (1879, p. 50): moist sandy soil.

E. fuscipennis Mg. As *E. flavescens*; also in saturated mud in marshes.

E. taenionota Mg. As *E. fuscipennis*; also in leaf-mould in woodland ditches, Knightswood (Glasgow). Beling records *E. lutea* larvae in wet hollows in leaf-mould, and along margins of streams.

E. trivialis Mg. Rich organic mud of marshes, e.g. Frankfield; also as *E. taenionota*.

Cheilotrichia imbuta Wied. (Mg.). An adult emerged from a vial in which *Erioptera* larvae were being reared, the material being found in a marsh near Oban, June 23rd, 1925 (1); see de Meijere (1920, p. 76).

Rhypholophus haemorrhoidalis Zett. Wet soil under leaves, in open deciduous woods, Cochno, Aug.-Sept. 1924, '25. Beling (1886, pp. 191-192).

Ormosia lineata Mg. Wet mud near water's edge at Yoker in association with *Poecilostola punctata*, *Dicranota bimaculata*, and *Tricyphona immaculata*; see Cameron (1917, p. 65).

O. uncinata de Meij. Sandy soil at margin of burn near Forth and Clyde canal, Yoker (1); under decaying leaves in Garscadden Wood, Sept. 1925.

Gonomyia dentata de Meij. Wet humus soil beside stream at wood near Quogach, St. Ninian's Bay (Bute).

G. tenella Mg. Moist leaf-mould at Tourgill (Largs).

Symplectomorpha stictica Mg. Moist sand at margin of burns, among decaying vegetation, with *Idioptera trimaculata*, *Eriopterae*, *Ormosia uncinata*. *Helobia hybrida* Mg. has been reared from moist sandy soil at margin of woodland stream (Beling, 1879).

Lipsothrix remota Walker. Reared from larvae collected in rich humus soil in large crevices of rocks beside cascade, at Twirrel Brig, Tourgill (1). Beling (1886, p. 192) records larvae of *L. icterica* Egg. (= *L. remota* Walk.?) as living in a decaying beech stump.

Phalacrochera replicata L. Aquatic mosses (submerged) in slow-flowing burn at Frankfield Marsh, June 1923, 1924. The early stages have long been known, de Geer (1776); Bengtsson (1897); Miall and Shelford (1897).

Dolichocheza albipes Ström. Wet moss on boulder beside cascade, Tourgill (Largs); Beling (1886, pp. 189-191): moss, moist soil, and in tussock of the liverwort (*Alilicula scalaris* Corda).

Sub-fam. TIPULINAE: genera *Prionocera*, *Tipula*, *Nephrotoma* (*Pachyrrhina*). For brevity the data on Tipulinae are given under general headings and the large number of references to literature are omitted (see Alexander 1920, pp. 978-981), see also Czizek, 1911, 1913.

1 (a). Species strictly aquatic, living in sand and gravel in rivers and swift-flowing streams: *T. montium* Egg., *T. (lateralis)* group sp.

(b). Species aquatic or sub-aquatic, rich organic mud of marshes and swamps, e.g. Frankfield, Possil: *Prionocera turcica* F., *T. lateralis* Mg., *T. luteipennis* Mg.

(c). Species in mud on margins of burns: *T. vittata* Mg., *T. lateralis* Mg., *T. luna* Westhof.

2 (a). Species at roots of grasses: *T. oleracea* L., *T. paludosa* Mg., *T. pagana* Mg., *T. subnodicornis* Zett. (1), hills above Kilmory, Isle of Bute.

N. (*Pach.*) *maculosa* Mg. (also at roots of coniferous seedlings, Ardgoil Forest Nursery, Lochgoilhead.)

(b). Species in leaf-mould in wet hollows in open woodlands: *T. maxima* Poda, *T. fulvipennis* de Geer, *T. lunata* L.

(c). *Species boring in wood, usually decomposing*: *T. irrorata* Macq.* (fallen tree in Garscadden Wood); *almost sound wood*: *T. flavolineata* Mg. (Ross MS.).

3. *Species feeding on mosses growing upon rocks, stone-dykes, usually near water*: *T. excisa* Schum., *T. marmorata* Mg., *T. rufina* Mg., *T. staegeri* Niel., *T. variipennis* Mg., *T. pagana* Mg. (1), *T. subnodicornis* Zett. (1).

SUMMARY.

Alexander (1920, pp. 716-717) has listed the known habitats from aquatic to terrestrial. From the literature, the above data on Clyde crane-flies, and MS. records kindly supplied by my friends, Mr. H. F. Barnes, B.A., and Mr. H. Britten, F.E.S., it is known that the sub-aquatic and strictly aquatic species number twenty, that the majority (forty-five spp.) of crane-fly larvae inhabit the moist soil of the margins of streams and the like situations in woods and glens; about fifteen species live in mosses growing upon rocks, stone-dykes, near by waterfalls; six species are fungicolous; over ten species are wood-borers.

When one considers that the number of crane-flies in the British Isles is over 275, it is apparent that our knowledge of the early stages is exceedingly meagre. In view of this fact, it seems pertinent to indicate the following five species, which are unknown in the early stages, although fairly common and wide-spread as adults.

Antocha vitripennis Mg. (described 1830): a summer crane-fly locally abundant, resting under leaves of vegetation beside waterfalls and like situations.

Geranomyia unicolor Hal. (described 1833): an autumnal species usually occurring on cliff-faces, in caves, under shore-herbage, etc. on the coast.

Hexatoma fuscipennis Curtis, *H. lucidipennis* Curt. (described 1836): somewhat scarce summer crane-flies which lurk among long grass, reeds, sedge, etc., near burns and in marshes, some Clyde localities being Cadder Wilderness, Cambusland, Gorge of Avon, Inch Moon (Loch Lomond), Glen Massan.

Dactylolabis frauenfeldi Egg. (described 1863): a rather rare insect in Clyde, having been found at Frankfield Marsh, Gorge of Avon, and Fiddler Gill (nr. Crossford).

The New World species of *Antocha* (*A. saxicola*, O.S.) is strictly aquatic in early stages, living in cases attached to submerged rocks and pebbles in rapidly-flowing streams; while *Geranomyia canadensis* Westw. is also aquatic, inhabiting the algal scum on rock-faces. In Europe von Roser (1834) states that larvae of *Hexatoma nigra*, Latr. (= *H. lucidipennis* Curt.?) lives in sand along banks of streams. Mik (1894) found the larvae of *Dactylolabis denticulata* Bergr. on cliffs wet continually with dripping water; and Nowicki (1867) records *D. woodzickii* Now. in similar situations in the Hungarian Tatra.

* Henderson's record [Trans. Nat. Hist. Soc. Glas. 1906, Vol. 8, N.S., Pt. 1, p. 10] of *T. pictipennis* Staeg. probably refers to *T. irrorata*.

Apart from the considerable ecological interest, the discovery of these and other larvae is of value in arriving at a natural classification. The life-histories of only about a dozen species are known in detail in Britain, and thus there is scope for the energies of many more investigators of our interesting crane-fly fauna.

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December 22nd, 1925.
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AN UNDESCRIBED MUSHROOM-FEEDING GALL-MIDGE.

BY H. F. BARNES, B.A.

(Research Scholar, Ministry of Agriculture.)

The writer has received for identification some minute gall midges (*Cecidomyiidae*) from Mr. E. R. Speyer, of the Experimental and Research Station, Cheshunt, reported as feeding on the mycelium of mushrooms grown under glass. On examination these midges proved to be quite different from any midge so far described.

The exact generic position of this species is at present uncertain. It may belong to the genus *Mycophila* Felt, in which the palps are described as being indistinct, while the antennae of the ♂ have twelve segments and those of the ♀ have nine, no mention being made of appendages. However, the writer cannot credit Dr. E. P. Felt with having overlooked antennal appendages, if there were any. Mr. F. W. Edwards, who has very kindly criticised this paper, stated (E.M.M., October 1925, p. 228) in a note on *Pezomyia vanderwulpi* Meij. that de Meijere's statement (Tijdschr. v. Ent., 42, pp. 140-51, 1899) about winged and wingless forms seemed to need confirmation. The writer considers that the reduced wings in one of the paratypes of this new species are not merely immature but a real reduction, thus approaching the wingless form of *P. vanderwulpi* Meij. Mr. Edwards agrees that, if both de Meijere's and the writer's statements are correct, there would be little objection to placing this new species in the genus *Pezomyia* Kieff. rather than *Mycophila* Felt.

It is therefore proposed to place this midge for the present in the genus *Pezomyia* Kieff., because of its great resemblance to *P. vanderwulpi* Meijere, and name it *P. speyeri* sp. n. or the Mushroom Midge. Later it may be necessary to raise a new genus for it owing to several differences. *P. vanderwulpi* Meijere has palps with three segments and the antennae in the ♂ have fourteen to fifteen segments and in the ♀ twelve to thirteen segments. *P. speyeri* sp. n. has palps with two segments and the antennae in the ♂ have eleven segments and in the ♀ ten segments. The minute details of the structure of the antennal appendages also differ in the two species. Apart from these differences, the two species are morphologically very similar. *P. brachyptera* Kieff., the only other species in the genus *Pezomyia* Kieff., is a whitish midge obtained from a toadstool near Algiers with thirteen-segmented antennae. *P. speyeri* sp. n. sometimes has the wings well

developed and sometimes reduced, thus resembling *P. vanderwulpi* Meij., and strengthening de Meijere's opinion concerning the two forms of the latter midge.

Pezomyia speyeri sp. n. (The Mushroom Midge).

♂. Eyes black, contiguous dorsally, rest of head except palps orange brown, with long hairs, palps fuscous, two segments, distal segment pointed. Antennae fuscous, 2+9, flagellar segments sessile with neck, $\frac{1}{3}$ — $\frac{1}{2}$ length of segment decreasing in length distally until 8th flagellar segment has no neck, 9th flagellar segment sessile, globular; in one paratype 8th and 9th flagellar segments are fused, forming apparently a bi-jodose segment. On the three basal flagellar segments two hyaline appendages in shape of stalked lamellae, on either side of these appendages two finger-shaped processes (fig. 1, a and b); on 4th and 5th flagellar segments single finger-shaped process on each side, two in all, instead of 4 as on three basal flagellar segments, no hyaline appendages; on four distal flagellar segments no hyaline appendages nor finger-shaped processes. On each flagellar segment three rings of setae, middle ring most prominent, distal ring slightly less prominent and less regular, both with stout setae reaching to middle of following segment; basal ring with short slender setae reaching just beyond middle ring. Neck pale yellowish. Thorax brown dorsally with dark hairs in sutures, pale mid-dorsal line, pale orange brown ventrally and laterally, scutellum brown, postscutellum elongate, raised, tubular as in *Contarinia* Rond. Wings (fig. 3), membrane with long hairs, subcostal joins costal at basal third, cubitus (3rd vein) reaches costa at apex of wing, cross-vein distinct, discoidal (4th vein) simple, obsolete distally, 5th vein forked; in one paratype the wings are reduced, and almost spatulate, veins very faint. Halteres pale, lamelliform, flattened, with long hairs. Legs fuscous, hairy, first tarsal segment nearly three times as long as second; second, third and fourth slightly decreasing in size, the three equal in length to the first segment; fifth segment two-thirds length of first segment. Empodium minute, claws moderately curved, simple. Abdomen reddish-orange, with short dark hairs; genitalia (fig. 2) fuscous, terminal clasp segment with long pointed 'oncle,' both clasp segments with short hairs, similar to that of *P. vanderwulpi* Meijere.

Body length: average of type and three paratypes 0.75 mm. Wing length: 0.5 mm.; reduced wing scarcely 0.25 mm.

♀. Palps fuscous, two segments, distal segment pointed with inner margin slightly eaten out (fig. 4). Antennae, 2+8, fuscous, three basal flagellar segments elongate, cylindrical, remaining five flagellar segments globular; all flagellar segments bearing medially one complete ring of stout setae, irregular stout setae on either side of complete ring; distally a sensorial, hyaline appendage in shape of complete collar with irregular free distal margin, collar on third segment appears to consist of two overlapping lamellae in type and one paratype (fig. 5). Legs fuscous, hairy, first tarsal segment twice as long as second, second, third and fourth segments bead-shaped, slightly longer than broad, co-equal; fifth segment two-thirds length of first segment. Ovipositor lamelliform, with long hairs, tri-articulate, fuscous, terminal joint rounded. In all other respects the same as in male, haltere in fig. 6.

Body length: 1.0–1.25 mm. Wing length: 0.75 mm.

Pupa: Orange, not enclosed in any cocoon, active and able to bury itself in soil if placed on the surface; found a short distance below the surface of the mushroom-bed soil.

Larva: Orange, 'anchor process' trilobed with long stalk, black; non-gregarious.

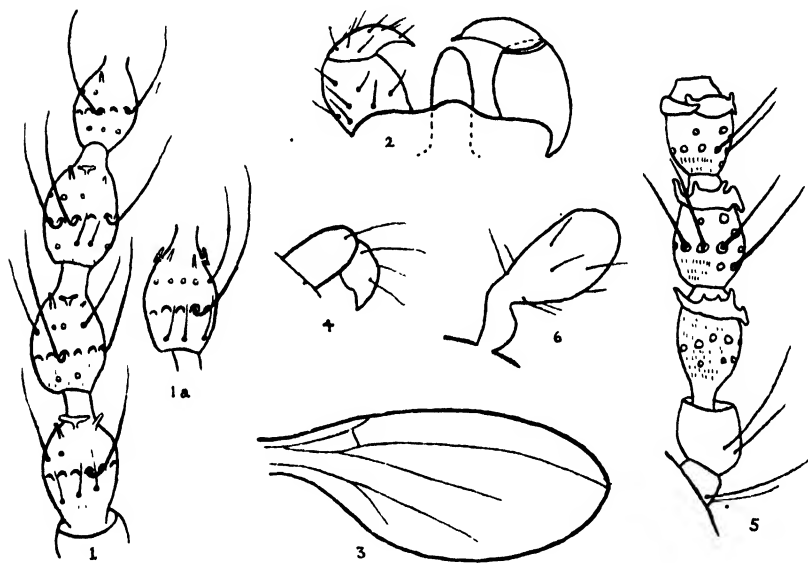
HABITAT: Mycelium of mushroom under glass, Cheshunt, Herts. Larvae, December—March; pupae and adults, January—March.

TYPES: ♂, ♀, pupa, larvae (3) in the writer's collection.

PARATYPES: Three ♂♂ and two ♀♀ in the writer's collection.

The writer has pleasure in dedicating this species to Mr. E. R. Speyer, who so kindly sent him the material.

THE MUSHROOM MIDGE (*P. speyeri* sp. n.).



1, Four basal flagellar segments of ♂ antenna; 1a, ventral view of third segment; 2, dorsal view of ♂ genitalia; 3, wing-outline; 4, biarticulate palpus of ♀; 5, five basal joints of ♀ antenna; 6, haltere of ♀, greatly enlarged.

Mr. Speyer has sent the writer some additional notes of the habits of this midge, which are as follows:—

'The Mushroom Midge described by Mr. H. F. Barnes was found first in the larval stage on December 24th, 1925, actually upon the mycelium of mushrooms grown in a glass-house at the Experimental Station, Cheshunt, Herts. An attempt to rear these larvae failed, but close watch was kept on the mushroom bed, and on January 29th, 1926, a few adults, obviously belonging to the larvae first collected, were obtained on the soil surface.

Owing to their minute size and dark orange colour, and the presence of red Acarines on the soil surface, the flies were difficult

to see, but at the end of February increased temperature and sunshine induced the midges to collect upon the glass panes of the hot-house, and quite a number were obtained.

In this connection it is interesting to note that the flies assembled on one particular pane of glass some fourteen feet distant from the place where they were found in the soil previously. It so happened that the midges were searched for at about the same hour on consecutive days, and it later transpired that they flew to that part of the house which received the fullest illumination. It is probable that the time of maximum emergence of flies from the soil corresponded with the maximum incidence of light on the pane of glass where the majority of flies were collected.

During the last days of February only females were found on the glass, and at this time only males were obtained on the surface of the mushroom bed. Later a few males appeared on the glass, and on March 2nd males were in the majority and no flies could be found on the soil. No doubt there was a migration of flies from their place of breeding at this time.

The flight is rapid and erratic; under conditions of dim light the flies become sluggish, but if exposed to bright light, together with lack of moisture, movement practically ceases, though a quick recovery is made if moisture is supplied. Adults of both sexes kept in a tube of soil with mushroom mycelium at the bottom burrowed down to the latter but no eggs could be found. A single female deposited one egg on the glass of a capsule; this egg was of a pink colour and some hairs from the body or wing of the female adhered to it.

It is probable that mating takes place on or below the soil surface soon after emergence from the pupa before flight, and that few eggs are laid singly and haphazard on or in the soil.

The larvae are active and are not gregarious. They were confined to a radius of a few feet in the bed, save for two which appeared some distance from the place where adults were collected later, and were usually quite near the soil surface. The pupa is capable of considerable movement and of burying itself if exposed on the soil surface: no covering or cocoon is made.

The cause of failure in a mushroom crop is often obscure, and it is not impossible that this midge—easily overlooked—may sometimes be the culprit. At present, however, we have no evidence that the midge is a pest of serious importance.'

S.E. Agricultural College, Wye, Kent.

March 1926.

The Stephensian Collection of British Hemiptera.—The British collections of insects formed by James Francis Stephens during the early part of the last century were purchased by the British Museum from Mrs. Stephens in 1853. The Hemiptera occupied nine drawers of one of the cabinets of Coleoptera and have until quite recently remained amongst the collections of that order. According to the Museum registers there are 346 Heteroptera (2,720 specimens) and 351 Homoptera (1,984 specimens). With the exception of a few specimens added since that time, these remain as they were labelled and arranged by Stephens himself, and the names naturally do not correspond with those of the present British List. It is not possible here to deal with many of the species, and in any case this would be of little value, since unfortunately the majority of specimens are without locality labels. Some light, however, is thrown on the distribution eighty years ago of a few species now rare with us. Several Continental species are also represented in the collection which do not now occur in this country. Whether these were actually British or not is a matter of doubt. On some specimens, however, the locality of capture is given, and in these cases it may be assumed that they were actually taken here, although it is very probable that they were introduced either accidentally in agricultural and other produce, or by some individual. The noteworthy forms may be grouped under three headings: A. Continental species without locality labels, not now occurring in Britain and probably actually foreign specimens: 2 *Sehirus morio* L., 1 *Coptosoma scutellatum* Geoffr., 1 *Eurygaster hottentotta* F., 4 *Raphigaster nebulosa* Poda, and 1 *Pirates hybridus* Scop. B. Continental species with definite British locality labels, but not now known to occur in Britain: 1 *Lygaeus (Spilostethus) saxatilis* Scop., S. Wales; 2 *Lygaeus (Spilostethus) alhomaculatus* Goeze, Bristol; 4 *Arocatus melanocephalus* F., S. Wales. C. Rare or local British species, the locality given when present on the specimens: 4 *Sehirus biguttatus* L., Highgate (not recorded from Middlesex by Butler), 1 *Peribalus vernalis* Wolff, 1 *Carpocoris fuscispinus* Boh., Windsor (the only other British records are from Devon, Cornwall and Essex), and 1 *Lygaeus (Spilostethus) equestris* L. The insect recorded from this collection by Butler in his last paper in the F.M.M. (Dec. 1925, p. 279) as *Halticus saltator*, under the name *rufifrons* Fall., was incorrectly named by me: it is really *Byrsoptera rufifrons*.—W. E. CHINA, British Museum (Nat. Hist.), London, S.W.7: *March 18th, 1926.*

Bolitochara mulsanti Sharp in Yorkshire.—I was much interested in Mr. James H. Keys' note on this insect in the January issue of this Magazine. A *Bolitochara* taken from the rotting branch of a tree on the ground in Kildale Wood, near here, in June 1917, turns out to be *mulsanti* Shp., so that the occurrence of the species in Britain is thus confirmed. *B. mulsanti* (= *elongata* Muls. and Rey, nec Heer) was re-named by Sharp in the Ent. Mo. Mag. for 1875, p. 132. I am much indebted to Mr. Keys for examining my example from the above-mentioned sub-Alpine wood.—M. L. THOMPSON, 40 Gosford Street, Middlesbrough: *February 1926.*

Phyllodrepa puberula Bernh. in Cumberland.—On reading Mr. Keys' note in the March F.M.M., p. 49, introducing this species to the British list, I examined my series of thirteen specimens of *P. floralis* Payk. and found that two of them agreed with the description of *puberula*. Mr. Keys has since very kindly confirmed the identification. Both specimens were taken in this district a considerable time ago—one beaten from sallow-bloom at Great Salkeld in April 1900, the other swept from mixed herbage at Durdar in July 1906.—F. H. DAY, 26 Currock Road, Carlisle: *March 12th, 1926.*

Phyllodrepa puberula Bernh. in St. Kilda.—On reading Mr. Keys' article on *Phyllodrepa puberula* Bernh. (E.M.M., ante, p. 49) I looked at my specimens of the genus. I had two under *P. nigra* Grav., very different in size, one of which is *P. puberula*. It was found in a bag of birds' nest rubbish, etc., which came from St. Kilda in July 1906, and agrees with an example of that species sent me by Colonel Deville.—NORMAN H. JOY, 78 Crescent Road, Reading: March 11th, 1926.

Antherophagus silaceus Herbst and *Aglenus brunneus* Gyll. in Ireland.—I wish to place on record the occurrence of the above beetles in Ireland. *Antherophagus silaceus* Herbst I swept from bent-grass on the North Bull, Co. Dublin (Dunes north of the Harbour), in August 1924 and again in August 1925. On both occasions it was taken in the vicinity of the nests of *Bombus agrorum* Fab., and I have to thank Mr. J. R. le B. Tomlin for the identification of the specimens. *Aglenus brunneus* Gyll. I obtained from flour and pollard sacks in a city flour store last August, and so far I have only taken two examples. Both the species are apparently additions to the Irish list. Some other insects of interest were found with the latter species, amongst which may be mentioned *Palorus ratzeburgi* Wiss. (= *depressus* Shp. Cat.), *Laemophloeus pusillus* Schönh., *L. ferrugineus* Steph., *Silvanus surinamensis* L., *Trigonogenius globulum* Sol. and *Niptus crenatus* F. I also took *Tribolium confusum* Duv., *Gnathocerus cornutus* F. and *Pentarthrum huttoni* Woll. on pollard sacks in a dairy at Clontarf, Co. Dublin.—EUGENE O'MAHONY, 'Minard,' Dublin Road, Sutton, Co. Dublin: January 19th, 1926.

Otiorrhynchus rugifrons Gyll. as a pest on strawberry.—Apropos of Mr. Fox Wilson's notes on the mining habit of the larva of *O. rugifrons* (E.M.M., Nov. 1925, pp. 273–276), attention may be called to a paper on the same species by Prof. F. H. Chittenden (Canadian Entomologist, Dec. 1925, pp. 290, 291), entitled 'Historical Notes on *Brachyrhinus rugifrons* Gyll.' This insect, he states, has been introduced into several localities in N. America, and is evidently destined to spread as a pest on strawberry, it having recently appeared in injurious numbers in the Pacific States. Specimens were collected near New York City as long ago as 1891, and there are numerous subsequent records from Canada and the Eastern and Pacific States, but the species is as yet unknown from the Central States between Pennsylvania and the Pacific Coast.—EDS.

Notes on Coleoptera in the Harpenden District.—In spite of the scarcity of beetles during the past year, a few noteworthy species have been captured in the Harpenden and St. Albans area. In January, Mr. Philip Harwood and I found *Trixagus elateroides* Heer hibernating in tufts of *Dactylis glomerata* growing in a disused gravel pit—the species was quite common where it occurred: a few *Encephalus complicans* Westw. were also found in these tufts. Mr. Harwood also captured *Panagaeus bipustulatus* F. (1) and *Amara convexiuscula* Marsh. Sifting manure-heaps in January and February yielded *Trogophloeus fuliginosus* Gr., *Euthia scydmaenoides* Steph., *E. schaumii* Kies. (1), *Monotoma spinicollis* Aubé, *M. testacea* Mots., and *M. longicollis* Gyll. The occurrence of *Cathartus advena* Waltl out of doors away from warehouses and stored goods is sufficiently unusual to make it worth while recording: Mr. Harwood and I so found it in heaps of dried cut grass. *Monotoma quadridentata* Thoms. and *M. longicollis* Gyll. were also present, the latter hard to see owing to its sluggishness and habit of clinging to small

pieces of grass, etc. In a small quantity of flood refuse collected in March from the banks of the River Lea we found *Atheta islandica* Kr., *A. exilis* Er., *Philonthus* (*Gabrius*) *trossulus* Nordm., *Stilicus erichsoni* Fauv., and *Trogophloeus arcuatus* Steph., rare. *P. trossulus* also occurred quite commonly in grass tufts that were growing in a waterlogged swamp—apparently this species prefers a very wet habitat. Grass-tuft cutting in another swamp gave us a series of *Bythinus burrelli* Denny. None of the males possessed the crescent-shaped antennal joint of the typical form, though one or two specimens showed a tendency in this direction. As Mr. Harwood and I took a considerable number of this species and neither of us found a fully developed male, it must be a very rare form in this locality, if it exists at all. I have since taken some more specimens but have again failed to find a typical male. In these tufts *Euconus hirticollis* Ill. was not uncommon. By sifting a heap of straw in March, Mr. Harwood discovered *Stilicus angustatus* Geoffr., and before long we had filled our tubes with a series of this beautiful and elegant species: a few specimens of *Atheta* var. *orbata* Er. were also discovered. We are indebted to Dr. Malcolm Cameron for confirming the identity of the latter. The water-net produced one or two interesting species: mention may be made of *Coelambus confluent* F. (1), *Hydroporus neglectus* Schaum, *H. umbrosus* Gyll., *H. melanarius* Stm., *H. tessellatus* Drap., and *Rhantus punctatus* Geoffr. Sweeping and beating in May gave poor results, even common species being scarce: however, I was pleased to find *Ceuthorrhynchus urticae* Boh. was still obtainable in its most restricted haunt. (It was distressing to watch the progress of the builder which will soon exterminate this rare species from its headquarters.) In my experience this beetle occurs on *Stachys* and not *Urtica* as given by Canon Fowler, *vide* Col. British Islands. Vol. V, p. 356.*

A small colony of *Lasius fuliginosus* well repaid for working. By means of traps consisting of handfuls of grass laid in the runs I captured *Homoeusa acuminata* Märk. (9), *Oxyptoda vittata* Märk., *Atheta pagana* Er. (3), *Zyras funesta* Gr., and *Z. laticollis* Märk. (1). Wet moss in June added some very interesting species to my collection—*Calodera rufescens* Kr. (1), *Atheta gemina* Er., *A. exiliformis* Joy, *Tachyporus transversalis* Gr., *Stenus melanarius* Steph., *Evaesthetus ruficapillus* Lac., and *Biblopectus ambiguus* Reich. By beating in June I obtained *Corymbites tessellatus* F., *Rhagonycha translucida* Kryn., *Orchestes stigma* Germ. (1), *Rhynchites mannerheimi* Humm., and *R. ophthalmicus* Steph. In August and September I again turned my attention to wet moss: *Ocyusa maura* Er. was common, also *Brachygluta impressa* Pz.; *Psela-phus dresdensis* Hbst. (1), a welcome novelty to me; *Sitona cambricus* Steph. (1); *Eriirrhinus scirrhosus* Gyll. was scarce.

I should like to make special mention of *Lathrobium elongatum* L. and its var. *fraudulentum* Ganglb. which occurred in this wet moss. I was able to identify this species and its var. satisfactorily through the kindness of the Rev. C. E. Tottenham, who has made a special study of the genitalia of this genus and who most kindly lent me his drawings of the aedeagi of the various species of the *geminum* group.

In mid-August I commenced working for *Sitona cylindricollis* Fahr., but without success. I afterwards found out I was too early for it. This species commenced appearing about August 31st: four specimens were taken on this date, all more or less immature. The first mature examples occurred on September 8th. I took a fair series on various occasions during this month, but even as late as September 30th I found immature and even soft, freshly

* Cf. Ent. Mo. Mag., vol. xxxi, p. 217, for the occurrence of *C. urticae* on *Stachys* at Snodland, Kent. It has also occurred at Cothill, Berks, on the same plant.—J. J. W.

emerged specimens. *Tychius meliloti* Steph. and *Apion meliloti* Kirb. occurred with, but much more commonly than, the *Sitona*. I took a short series of *Xylophilus populneus* Pz. by sweeping *Polygonum aviculare*: every time I visited the *Sitona* ground I swept the *Polygonum* and was generally rewarded with one or two specimens of *Xylophilus*. I am again indebted to Messrs. P. Harwood and J. H. Keys for their kind and valued assistance in identifying critical species for me.—B. S. WILLIAMS, Kingcroft Road, Harpenden: February 7th, 1926.

Coleoptera from Glenluce, Wigtownshire.—I spent my Easter holiday in 1925, from April 10th to 13th, with my friend Mr. Bowhill, hunting for beetles on the belt of sand-hills round the head of Luce Bay, Wigtownshire, and on the adjacent seashore. There are very few records of beetles from this district of Scotland. I have, therefore, thought it desirable to give a complete list of our captures. Most of our time was spent in pulling up and shaking over paper the thick moss which grew in certain areas of the dunes, sheltered to a slight extent from the prevailing S.W. winds, which I may say were fairly strong during our visit.

By this plan we secured the following species:—*Dyschirius globosus* Hbst., *Bradycellus harpalinus* Dej., *B. similis* Dej., *Olisthopus rotundatus* Payk., *Calathus flavipes* Fourc., *Anchomenus dahli* Borre., *A. fuliginosus* Panz., *A. piceus* L., *Bembidium guttula* F., *B. lampros* Hbst., *Conosoma lividum* Er., *Tachyporus obtusus* L., and v. *nitidicollis* Steph., *T. chrysomelinus* L., *T. hyphorum* F., and v. *meridionalis* Fairm., *T. brunneus* F., *Megacronus analis* Pk., *Mycetoporus longulus* Mann., *M. splendens* Grav., *Ocyus brunnipes* F., *O. cupreus* Rossi, *Quedius cinctus* Payk., *Q. fuliginosus* Grav., *Q. tristis* Grav., *Q. nigriceps* Kr., *Q. maurorufus* Grav., *Q. rufipes* Grav., *Q. fulvicollis* Steph., *Q. hoops* Grav., *Philonthus vernalis* Grav., *P. nigrita* Nordm., *P. micans* Grav., *Xantholinus punctulatus* Payk., *Lathrobium geminum* Kraatz, *L. brunnipes* F., *L. quadratum* Payk., *L. punctatum* Zett., *Cryptobium glaberrimum* Hbst., *Stenus speculator* Er., *Lesteva punctata* Er., *Lathrimaeum atrocephalum* Gyll., *Phloeobium clypeatum* Müll., *Scydmaenus collaris* Müll., *Paramecosoma melanocephalum* Hbst., *Cytilus varius* F., *Mantura obtusata* Gyll., *Eirrhinus bimaculatus* F.

Under the dried-up carcasses of rabbits we found *Aleochara lanuginosa* Grav., *Proteinus brachypterus* Er., *Necrophorus humator* Goez. in swarms, *Choleva nigrita* Er., *C. chrysomeloides* Panz., *Nitidula bipustulata* L.

It was too early in the season to hope to find many insects crawling about on the bare sand, but the following were picked up:—*Philopodon geminatus* F., *Helops striatus* Fourc., *Apion humile* Germ., *Coccinella 11-punctata* L., the type and the var. with the two hinder spots confluent; *Lochmaea suturalis* Thoms., *Geotrupes typhoeus* L., only one specimen of this last species was found, but there were numerous burrows, evidently the work of this species. As far as I know there are very few records of *G. typhoeus* north of the Tweed.

In a damp hollow between a belt of high dunes *Bledius fuscipes* Rye was found in great abundance; and by sifting seaweed on the shore the following were secured:—*Cercyon littoralis* Gyll., *Aleochara grisea* Kr., *Cafius xantholoma* Grav., *Oxytelus rugosus* F., and *Homalium laeviusculum* Gyll. We did a little work with the water net in one of the larger pools in the sandhills, but found only *Hydroporus morio* Dej. and *H. gyllenhalii* Schiöd.

None of the above-mentioned, except possibly *Philonthus vernalis* Grav., are scarce or very local, but several have not been previously recorded from the

Solway area.—T. HUDSON BEARE, 10 Regent Terrace, Edinburgh : February 9th, 1926.

Zicrona caerulea L. in Wigtownshire.—While searching for beetles in the moss on the Glenluce sandhills, a few species of Hemiptera were found, but the only one worth notice was a beautiful fresh specimen of *Zicrona caerulea*, a very rare species in the north of England and south of Scotland.—T. HUDSON BEARE : February 11th, 1926

An Australian Oecophorid in South Devon.—On the morning of August 22nd, 1925, while staying at Dawlish, I found resting on a window-curtain a peculiar Oecophorid quite unknown to me. Later it came to my notice that two specimens of an Australian Oecophorid, of a similar description, had already been recorded from South Devon, originally under the name *Ocystola aethopis* Meyr. (Entomologist, Vol. XLIII, 1910, p. 96), afterwards as *O. acroxantha* Meyr. (ibid., Vol. I., 1917, p. 265), the first identification having been erroneous. On comparing my specimen with some examples of *O. acroxantha* from Australia and New Zealand in the British Museum (Nat. Hist.), I found there was no doubt that it was identical with these. The species was originally described by Mr. E. Meyrick in the 'Proceedings of the Linnaean Society of New South Wales,' Vol. 9, 1885, p. 1066; it is now however assigned to the genus *Parocystola* (cf. Meyrick in Wytzman's 'Genera Insectorum,' fasc. 180, p. 98). In size and build the moth resembles the common *Oecophora pseudospretella*; but its forewings are reddish-fuscous, and have conspicuous orange-yellow terminal cilia. On finding this specimen, I remembered having noticed, a fortnight previously, a damaged forewing of the same species among rubbish in a flour-mill near bv; returning to the mill, I unravelled many old spiders' webs and searched through the mangled remains of several hundred *O. pseudospretella*, *Endrosis lactella* and *Ephestia kuehniella*, but could find no trace of the other. According to Meyrick, the larva of *P. acroxantha* feeds in spun leaves of *Eucalyptus* (which grows well in South Devon). Perhaps some entomologist who lives in the district can supply more information as to how the species maintains itself there.—E. G. R. WATERS, 184 Woodstock Road, Oxford : February 3rd, 1926.

Phalonia gilvicomana Z. on the Cotswolds.—It was my good fortune in 1924 (see Ent. Mo. Mag., Vol. II, p. 18, 1925) to capture in Devonshire a number of specimens of this pretty Phaloniid, which had been 'lost' as a British insect for over forty years; but the place of origin of the existing British specimens, all of which were captured in 1879 by Mr. F. O. Standish of Cheltenham, remained unknown. The mystery can now, I think, be cleared up. While looking through some collections of Micro-Lepidoptera presented in recent years to the Oxford University Museum, I came across five specimens of *P. gilvicomana*, wrongly identified as *P. curvistrigana* Wilk., all captured on the Cotswolds. Four are in the collection of the late Mr. W. G. Pogson-Smith, and are labelled 'Cotswolds 27.vi.98,' 'Birdlip 28.vi.00,' and 'Birdlip 1.vii.00' (2) respectively; the fifth, labelled 'Cotswolds 21.vi.98,' is in the collection of the late Mr. A. Sidgwick. The specimens are in fair condition, though one has no abdomen. No doubt all were captured at Birdlip, where the two gentlemen in question used to collect Lepidoptera together. As Birdlip is only five or six miles from Cheltenham, it is highly probable that this, or some place in the vicinity, was the locality known to Mr. Standish. There is no reason to suppose that the moth has become extinct in this locality since 1900.—E. G. R. WATERS : February 4th, 1926.

Insects in the Swansea neighbourhood.—Since writing my note on a few insects from the Swansea district (*antea*, p. 36), I have had some sawflies and ichneumon-flies kindly determined for me by the Rev. F. D. Morice and Mr. Claude Morley respectively. As records of these insects from South Wales appear scarce it may be worth while noting them. They were all taken within a few miles of Swansea, mainly in the Clyne Valley, and detailed localities are unnecessary in most cases.

TENTHREDINIDAE.—*Priophorus padi* L., *Tomostethus ephippium* Cam., and *Emphytus cinctus* L.

ICHNEUMONIDAE.—*Ichneumon deliratorius* L., *Pimpla brevicornis* Gr., *P. maculator* F.; *Acrodactyla degener* Hal. (an interesting species externally parasitic on spiders and only recorded from Norfolk, Devon and Surrey); *Bassus laetatorius* F., *B. tricinctus* Gr.; *Homocidus deplanatus* Gr. (only recorded by Morley from Shere and Notts., probably parasitic on *Syrphus*), *H. pictus* Gr. (a woodland species); *Promethus sulcator* Gr.; *Mesoleius variegatus* Jur. (not a common insect); *Perispodus sulphuratus* Gr. (a marsh lover and local in its distribution); *Casiniaria ischnogaster* Th. (by no means an abundant species, taken by Marshall in S. Wales); *Canidiella trochantella* Th. (rare in Britain); *Omorga faunus* Hlmgr.; *Meloboris rufiventris* Gr. (on reeds, Clyne Common, a local species with few records, always taken in marshy places), and *M. crassicornis* Gr.

BRACONIDAE.—*Macrocentrus abdominalis* F., and *Chaenon anceps* Hal. (figured by Curtis, Brit. Ent., pl. 289).—W. J. FORDHAM, Low Fell, Gateshead: February 7th, 1926.

A note on Alomyia debellator Fab.—On many occasions during the last twenty years I have taken or observed this peculiar Ichneumon-fly in localities as far apart as Shere (Surrey) and St. Kilda (forty miles beyond the Outer Hebrides), and in surroundings as diverse as (a) an empty city building site with its casual and temporary flora, (b) the edge of a glade in an old-established beech wood, and (c) on an eighteen-inch ledge some hundreds of feet above the Atlantic and about one hundred feet from the cliff top. In these situations the parasite occurred in such numbers as to make me fairly certain that it was at home, and indeed the sluggishness of *Alomyia* makes it unlikely that any extensive wanderings are attempted. The flight of this insect is generally slow and low, and it has a curious habit of pitching suddenly downwards and burying itself in the undergrowth. The male is more commonly seen than the female and sometimes occurs in such numbers over tussocky ground as to suggest that assembling is taking place. This was especially noticeable in St. Kilda where the species is common in June and July. On this island the parasites were frequently observed crawling near or coming to the roots of dock—an observation now fully explained by Mr. Stenton's note below.—JAMES WATERSTON, Brit. Mus. (Nat. Hist.), London: March 16th, 1926.

[In 1919 I was able to establish the fact that Hepialid larvae are the hosts of *Alomyia debellator* Fab. Males of the Ichneumon were observed assembling over the workings of a *Hepialus* sp. and in the tunnels themselves the female *Alomyia* were discovered. Pairing and oviposition of the parasite were observed and controls established to ascertain the specific identity of the host (probably *H. humuli* and *H. lupulinus*), but unfortunately both the parasitised larvae and the controls met with disaster.

While I hope later to publish in greater detail my notes of the observations just referred to, I am meantime glad, in response to a request by Dr.

Waterston, to have an opportunity of dissipating the mystery that has hitherto surrounded the life-history of this curious Ichneumon—and all the more so since a knowledge of the connection between *Alomyia* and *Hepialus* may have some economic importance.—RUPERT STENTON, Ministry of Agriculture, Pathological Laboratory, Harpenden.]

Gastrophilus equi and other insects on mountain tops.—In continuation of the notes on this subject (pp. 19 and 60) I may say I took a specimen of *G. equi* on Shap Tor, S. Devon, in July 1924, and one of *Oestrus ovis* near Haytor Rock, in the same county and same month. Shap Tor is about 800 feet high and my attention was drawn to the insect, whilst I was sitting on the summit rock, by its flying round me with a very obvious bee-like humming. The spot where I took *Oe. ovis* is about 1,300 ft. up and near the well-known quarry. In 'The Vasculum' for June 1916, Mr. George Bolam records seeing a number of wasps (*V. germanica*) on the Stony Rig, in Grey Pot, and on Cross Fell, in Cumberland. Cross Fell is 2,930 feet high. He also records nests of *V. sylvestris* at an altitude of about 1,200 feet in the same district, and says that up there wasps feed on the blackberries (and visit the crowberry flowers) as well as on *Larentia caesiata*!—C. NICHOLSON, 35 The Avenue, Hale End, E.4 : March 1926.

A note on a Dipterous Parasite of Ladybirds.—W. Lundbeck in his 'Diptera Danica' Part VI (Copenhagen 1922) gives on p. 419 an interesting summary of the habits of the Phorid flies of the genus *Phalacrotophora* Enderlein. He states that both Martelli and Lichtenstein have seen the adult flies sucking Coccinellid larvae and pupae, and the latter found that the eggs were laid between the legs of the pupae. Last summer I made some observations on one of our British species, *Ph. fasciata* Fall., at Oxshott, Surrey. On June 22nd I found two adult flies, male and female, sitting inside a curled birch leaf sucking the pupa of *Adalia bipunctata* L. Pupae of this species and also of others on the pines were collected. One pupa of *A. bipunctata* L. produced three ♀ and two ♂ of the fly, while a pupa, probably of *Mysis oblongoguttata* L., from the pine trunks produced three ♂ and two ♀. The flies emerged in my absence some time in August. Parasitized pupae may be known by a change in parts which are normally white to yellowish.—O. W. RICHARDS, 47 Marston Street, Oxford : January 24th, 1926.

Note on Notonecta halophila J. Edw.—The 'Bulletin de la Société entomologique de France,' 1925, pp. 256, 257, contains a note on the synonymy of this species by M. Raymond Poisson, based upon an examination of British specimens communicated by Mr. G. E. Hutchinson. In this article *N. halophila* J. Edw. (1918) is stated to be identical with *N. viridis* Delcourt (1909), which is found in brackish water in the north-west of France.—EDS.

Protanurophorus pearmani Womersley—New Locality.—This new species of Collembola described by myself (F.M.M., Nov. 1925) from specimens taken at Lawrence Weston, on the Gloucestershire side of Bristol, can now be recorded from Somerset. I obtained two specimens by shaking lichen-covered fallen branches found in the woods of Backwell Hill House, West Town, on January 3rd, 1926. The distance between the two localities now known will be about eight miles in a direct line, so that this species would seem to be fairly widely distributed in the district, and should be looked for elsewhere.—H. WOMERSLEY, Sunny Meads, West Town, Somerset : January 14th, 1926.

Periodicals, etc., received.

(Continued from p. 44.)

British Museum (Natural History). Picture Postcards.—Sets E 29–E 38 [29, 30, Exotic Butterflies; 31, 32, Exotic Moths; 33, 34, Exotic Beetles; 35, Exotic Homoptera; 36, Exotic Heteroptera; 37, 38, Exotic Orthoptera] have now been issued.

These ten sets bring up the number of postcards of insects published by the Museum to a total of 210, of which 170 are in colour. Each set contains five coloured cards and an explanatory leaflet, priced at 1/-. Most of them are extremely good, a few of the moths excepted, but why the Bee-moth (*Galleria mellonella*), no habitat for which is given on the leaflet, is included in the exotic series we do not know.

Occasional Papers of the Boston Society of Natural History, Vol. 5, September 1925.

'The Crane-flies (Tipulidae) of New England: First supplementary list,' by C. P. Alexander.

Proceedings of the Boston Society of Natural History, Vol. 38, No. 2, November 1925.

'Diptera of the Harris Collection,' by C. W. Johnson.

Ohio Journal of Science, Vol. XXV, No. 6, November 1925.

'A Review of the Genus *Eristalis* Latreille in North America,' Part II, by F. M. Hull. 'Aphids New to Ohio,' by C. W. Cutright.

Illinois Biological Monographs, Vol. IX, No. 4, October 1924.

'Animal Ecology of an Illinois Elm-maple forest,' by A. O. Weese.

Lists of dominant and sub-dominant Coleoptera, Diptera, Hemiptera, Hymenoptera (Formicidae), etc., are given at length. The dominant Coleoptera include various Chrysomelidae and single species of *Notoxus*, *Telephanus*, *Phalacrus* and *Phytonomus*; and the Hemiptera, single species of *Empoasca*, *Erythroneura*, *Corimelaena*, *Lygus*, *Blissus*, and *Corythucha*.

Psyche, No. 22, October 1925.

Contains an important paper on Termitidae entitled 'The Origin of Instinct, as illustrated by the War between the Ants and the Termites,' illustrated by 8 photographic plates, by Professor E. Bugnion.

Journal of Morphology, Vol. 30, No. 7, 1917, Reprint.

'*Zeugophora scutellaris* Suffr.', by B. H. Grave.

The life history of this Holarctic species is described, and the larva, pupa, etc., figured. The larva of *Z. flavicollis* Marsh. was described (but not figured) by Kaltenbach in 1874, but no figure of a pupa of a *Zeugophora* had been published up to the date of the present article. Mr. Grave's note has not been seen by some of our British Coleopterists, and attention is therefore called to it. The larvae of the species of this genus mine the leaves of various species of poplar.

Journal of Agricultural Research, Vols. XXX, Nos. 6–9, Vol. XXXI, No. 5, 6, reprints, 1925.

'Relation between mortality of trees attacked by the spruce budworm (*Cacoecia fumiferana* Clem.) and previous growth,' by F. C. Craighead.

'Two imported egg parasites of the Gipsy moth, *Anastatus bifasciatus* Fonsc. and *Schedius kuvanae* Howard,' by S. S. Crossman.

'Some Lepidopterous larvae resembling the European corn borer (*Pyrausta nubilalis* Hübner),' by W. O. Ellis.

'Identity of the mealybug described as *Dactylopus calceolariae* Maskell,' by H. Morrison.

'The Ham beetle, *Necrobia rufipes* De Geer', by P. Simmons and G. W. Ellington. This article is illustrated by two plates, one showing the earlier stages of the insect and the other the damage done by it to ham and cheese.

'Behaviour of *Phytophaga destructor* Say [Hessian fly] under conditions imposed by emergence cages,' by W. H. Larrimer.

Proceedings of the Entomological Society of Washington, Vol. 27, No. 6, June 1925, reprint.

'The Genus *Coccotorus* Leconte (Coleoptera, Curculionidae),' by F. H. Chittenden.

This genus of weevils is allied to *Anthonomus* and all three species attack wild or cultivated plum; the new one described (*C. pruniphilus*) was reared from the seed of *Prunus minutiflora*.

Zoologica, Vol. V, No. 21, March 1925.

'Hemiptera-Heteroptera from the Williams Galapagos Expedition,' by H. G. Barber.

Nine species, seven of which are treated as new, are added to the Galapagos fauna. Twenty-one species had previously been recorded from the islands, ten of which are neotropical forms. A new *Halobates*, *H. robustus*, taken in Conway Bay, Indefatigable Island, is also described and figured. Papers on the insects of the Galapagos were noticed in our last volume, pp. 21, 165.

Memorias de la Sociedad Cubana de Historia Natural 'Felipe Poey', Vol. VI, Núms. 3 y 4, 1923-1924, Reprint.

'Concerning some Tingitidae occurring in the West Indies,' by C. J. Drake and S. C. Bruner.

One new genus (*Caloloma*) and three species (*Caloloma uhleri*, *Gelchossa deceptiva*, *Acanthocheila sigillata*) are described.

'Notes on some Tingitidae from Cuba (Hemiptera),' by same authors.

One new species described, *Leptohyrsa binotata*.

Ministerio da Agricultura, Industria e Commercio, Rio de Janeiro, Brazil, Boletim, Nos. 2-4, 1925.

No. 2: 'Pulgões do Brasil' (deals with various species of Aphididae).

No. 3: 'A Broca do Café, *Stephanoderes coffeae* Hag.' (the egg, larva, pupa, and imago of this destructive Bostrichid-beetle are figured, and an account of its habits given).

No. 4: 'A Cigarrinha Vermelha da Canna de Assucar, *Tomaspis liturata* Lep. et Serv.' (an insect attacking sugar-cane, of which an account is given, illustrated by 2 coloured plates).

The three articles are by the same author, Dr. Carlos Moreira.

Ministerio da Agricultura, Industria e Commercio, Serviço de Informações.

'Os Percevejos Capsideos do Fumo no Brasil,' by Dr. Carlos Moreira.

Deals with two species of Hemiptera (*Engytatus notatus* Dist. and *E. geniculatus* Reut.) attacking tobacco in Brazil.

Proceedings of the Hawaiian Entomological Society, Vol. VI, No. 1 (August 1925).

Contains papers by D. L. Crawford (Psyllidae and Chermidae), W. M. Giffard (Cixiidae), F. Muir (Status of anterior processes in male genitalia of Homoptera, illustrated by 8 plates), R. C. L. Perkins (on introduced

and immigrant Chalcid-flies), Hugh Scott (on occurrence of *Lyctus villosus* Lesne in the Hawaiian Islands), O. H. Swezey (Maui insect notes and records, Tomato Hawk-moth in Hawaii, etc.), P. H. Timberlake (new Chalcid-flies from Panama and Hawaii), F. X. Williams (a Prothetelous larva of *Monocrepidius exsul*).

Department of Finance, Japan, Imperial Plant Quarantine Service, Revenue Bureau, Technical Bulletin, Nos. 2, 3, September and December, 1925.

Bulletin No. 2, pp. 42 and 11 plates, printed in English, forms Part II of 'The Diaspine Coccidae of Japan,' the genus *Lepidosaphes* being here dealt with by Inokichi Kuwana.

Bulletin No. 3, also printed in English, includes Part III of the 'Diaspine Coccidae of Japan,' pp. 20 and 7 plates, by the same author; and (2) 'New Encyrtinae from Japan,' pp. 21-30 and 1 plate, by Tei Ishii.

China Journal of Science and Arts, Vol. III, No. 11, 1925.

The November number of this Journal (pp. 606-608) contains an interesting article entitled 'Notes on collecting *Microvelia* [Heteroptera, Veliidae] by W. E. Hoffmann. Some species of this genus are said to be so abundant near Canton in China that they can be collected with almost any kind of equipment. The writer says that their metamorphoses may easily be studied by keeping specimens in aquaria, and that some species complete their life-histories in two weeks, and will continue breeding throughout the year if kept at room temperature. Winged and wingless forms have been reared by him from eggs deposited on the same day by the same adult female. Winged specimens are stated to have been seen to refuse to abandon dried-up ponds as well as to arrive at such places as if content to stay there.

Philippine Journal of Science, Vols. XXVII, XXVIII, 1925, Reprints.

'Anthicidae,' by H. Krekich-Strassoldo; 'Tenebrionidae (*Platydesma* Cast.),' by H. Gebien; Nomenclatorial notes on Jassoidea, IV,' by C. F. Baker; 'A new species of *Sambus* (Buprestidae) from Manila,' by W. S. Fisher; 'Tenebrionidae (*Anisocara*, *Spiloscapta*, *Menimus*, *Labidocera*, and *Pentaphyllus*),' by H. Gebien; 'Deux Melasidae Nouveaux des Philippines' by E. Fleutiaux; '*Leptotrichalus*' n. gen. (Lycidae, 3rd paper), by E. Kleine; 'Remarks on certain Indo-Malayan *Fulgora*, with especial reference to Philippine species,' by C. F. Baker; 'Die Gattung *Prioptera* Hope (Coleoptera, Cassididae),' by F. Spaeth. The Fulgoridae, seventeen of which are described as new, are illustrated on the ten plates accompanying Mr. Baker's paper.

La Vida de los Insectos.—'La *Lymantria dispar* (Lagarta) y sus enemigos,' by Manuel M. de la Escalera, pp. 16 and 12 figures, dated Villaviciosa de Odón, March 1925.

Societies

ENTOMOLOGICAL SOCIETY OF LONDON: *Annual Meeting, Wednesday, January 20th, 1926*.—Mr. W. BATESON, F.R.S., Vice-President, in the Chair.

Dr. S. A. Neave read the Report of the Council, which was adopted on the motion of Mr. H. Willoughby Ellis, seconded by Mr. S. Edwards.

The Treasurer read his Report, and this, together with the Accounts, were adopted on the motion of the Rev. G. Wheeler, seconded by Commander Walker.

It was announced from the Chair that the following Fellows nominated as Officers and Council for the ensuing year had been duly elected in accordance

with the Bye-Laws :—*President*, Prof. E. B. Poulton, M.A., D.Sc., F.R.S., etc.; *Treasurer*, W. G. Sheldon, F.Z.S.; *Secretaries*, S. A. Neave, M.A., D.Sc., F.Z.S., N. D. Riley, F.Z.S.; *Librarian*, H. J. Turner; *Other Members of Council*, Prof. W. A. F. Balfour-Browne, M.A., F.Z.S., Mr. W. Bateon, M.A., F.R.S., G. C. Champion, F.Z.S., A.L.S., E. A. Cockayne, M.A., M.D., F.R.C.P., H. M. Edelsten, H. Eltringham, M.A., D.Sc., F.Z.S., J. C. F. Fryer, M.A., Prof. Sir T. Hudson Beare, B.Sc., F.R.S.E., K. Jordan, Ph.D., G. A. K. Marshall, C.M.G., D.Sc., F.R.S., W. Rait-Smith, H. Scott, M.A., Sc.D.

In the absence of the President, Professor E. B. Poulton, F.R.S., his Address was read by Dr. S. A. Neave, and at its conclusion a vote of thanks to the President, coupled with a request that the Address might be printed in the Proceedings, was moved by Mr. J. E. Collin, seconded by Dr. H. Scott, and carried unanimously.

A vote of thanks to the Officers for their services during the year was then passed on the motion of Dr. K. Jordan, seconded by Professor Balfour-Browne, and Mr. W. G. Sheldon, Dr. S. A. Neave and Mr. H. J. Turner briefly replied.

Wednesday, February 3rd, 1926.—Professor E. B. POULTON, F.R.S., President, in the Chair.

The President announced that he had nominated Dr. H. Eltringham, Dr. K. Jordan, and Dr. H. Scott as Vice-Presidents for the coming year.

Mr. R. M. Harris, Mpangeni, Zululand, was elected a Fellow of the Society.

Professor E. B. Poulton, F.R.S., exhibited specimens sent by Dr. Kunhi Kannan, of Bangalore, demonstrating the fact that the larva of *Hyperechia xylocopiformia* Walk. preys upon the larva of *Xylocopa tenuiscapa* Westw. in S. India; also an example of a rare Brenthid beetle, *Platysystrophus sallei*, introduced in American oak. Mr. T. Bainbrigge Fletcher exhibited and made remarks upon photographs and coloured drawings of two remarkable caterpillars from Assam. Mr. E. Marks exhibited and made remarks upon examples of *Papilio podalirius* ab. *undecimlineata*, and a variety of *Euwanessa antiopa*. Mr. G. Fox-Wilson exhibited lantern slides to illustrate his paper on 'Insect visitors to the sap-exudations of trees.'

Wednesday, March 3rd, 1926.—Professor E. B. POULTON, F.R.S., President, in the Chair.

The President called attention to the great loss the Society had sustained by the death of Mr. W. Bateson, F.R.S., and an unanimous vote of condolence with his family was passed.

The deaths of Mr. A. E. J. Carter and of Mr. C. Fenn were also announced.

It was announced that Dr. F. A. Buxton had been co-opted to serve on the Council in the place of the late Mr. W. Bateson.

The following were elected Fellows of the Society :—B. Blaker, Warrilow, Barnham Junction, Bognor; R. Kelly, 59 Swanston Street, Melbourne, Victoria; D. S. Sevastopulo, c/o Ralli Brothers, Karachi, India; E. B. Worthington, Caius College, Cambridge.

Mr. H. Donisthorpe exhibited an observation nest of *Acanthomyops brunneus* and made remarks on the myrmecophiles associated with this ant. Dr. K. Jordan discussed the Dutch form of *Chrysophanus dispar* and exhibited British, Dutch, German and Hungarian examples of this butterfly. Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited examples of *Papilio jordani* Fruhs. from N. Celebes, and of *P. tdaeoides* Hew. from the Philippines. Mr. B. N. Schwanitsch, a visitor, exhibited lantern slides to demonstrate the evolution of the wing pattern in Rhopalocera.—S. A. NEAVE, *Hon. Secretary*.

ON TWO SPECIES OF COLLEMBOLA, *LEPIDOCYRTUS PARADOXUS*
UZEL AND *L. ANGLICANUS* N. SP.

BY C. H. N. JACKSON, B.SC.

The main purpose of this paper is to describe a new species of *Lepidocyrtus* recently taken by myself at Wicken Fen, where I am engaged on a survey of the Collembola with a view to contributing an account of that group to 'The Natural History of Wicken Fen,' edited by Professor J. Stanley Gardiner.

The new species is possibly related to *L. paradoxus* Uzel, a form recorded from various parts of Eastern Europe, but not from Britain. I have been unable to find any figures of *L. paradoxus*, but have examined a specimen in Dr. Carl Börner's collection at the British Museum and have drawn figures from it. Before proceeding to the description of the new species it may, therefore, be best to reproduce Uzel's original description (*Sitzungsb. Böhm. Ges.*, 1890, II Band, 50) of *L. paradoxus*, and to add the notes which I have made from Dr. Börner's specimen. *L. paradoxus* and *L. anglicanus* belong to the *cyaneus*-group of the subgenus *Lepidocyrtus*, s. str., and for the purposes of comparison I have added two drawings made from a typical British specimen of *L. cyaneus* Tullberg in my collection.

Lepidocyrtus paradoxus Uzel.

'Obscure caeruleus, acneo-nitens, interdum viride-aeneus aut cupreus, squamis detritis caeruleis, maculis minutis pallidis conspersus, suturis segmentorum et fascia inter maculas oculares curvata albidis. Antennarum articulo primo albedo, lurido aut pallide violaceo, articulis ceteris obscure violaceis aut griseo-violaceis, secundo autem interdum ipsa basi pallidiore. Pedibus dentibusque furculae albidis, furcula manubrio violaceo. Antennarum articulo tertio secundo longiore, quarto longitudine fere aequante, longitudine autem saepissime variante. Mesothorace caput deflexum valde superante, in margine anteriore pilis ad caput deflexis instructo. Segmento tertio abdominis fere $\frac{1}{2}$ longitudinis articuli quarti. Ventre setis longioribus. Dorso nonnullis setis longissimis. Unguiculis et mucronibus ut in ceteris huius generis speciebus. Long. corp. 2-3 mm.'

The unguiculus is lanceolate on all the feet, and the unguis bears two median teeth on its inner margin and two large lateral teeth on the outer side near the base. The tenent hairs of the first pair of feet (fig. 1a) are dilated apically on the ventral side only and have a straight dorsal edge. The tenent hairs of the second and third pairs of feet (fig. 1b) are dilated both dorsally and ventrally at the apex into large, triangular expansions of a very characteristic type. The mucro (fig. 1c) is well rounded ventrally, and the basal spine is long and thin.

Lepidocyrtus insignis Reuter is now generally agreed to be a colour variety of *L. paradoxus*.

The species is recorded from Norway, Finland, Germany, Austria, Switzerland and Rumania (pre-war boundaries).

Lepidocyrtus anglicanus n. sp. is apparently intermediate between *L. paradoxus* and *L. cyaneus* Tullberg, which last it approaches in the poor development of the mesonotum. The colour, on the other hand, rather closely resembles that of *L. paradoxus*; but the present species is distinguished from both of these by the structure of the feet and mucrones.

Lepidocyrtus cyaneus Tullberg has two spines set close together on the inner margin of the unguis (fig. 2a), and a faint tooth can sometimes be detected on the outer border. The tenent hairs are not dilated distally, and are rather short. The mucro (fig. 2b) has a long, thin basal spine, as in *L. paradoxus*. The pubescence is much feebler than that of *L. anglicanus*, especially on the legs.

Lepidocyrtus violaceus and *L. purpureus* Lubbock, as well as *L. assimilis* and *L. pallidus*, both of Reuter, are all now regarded as forms or varieties of *L. cyaneus*.

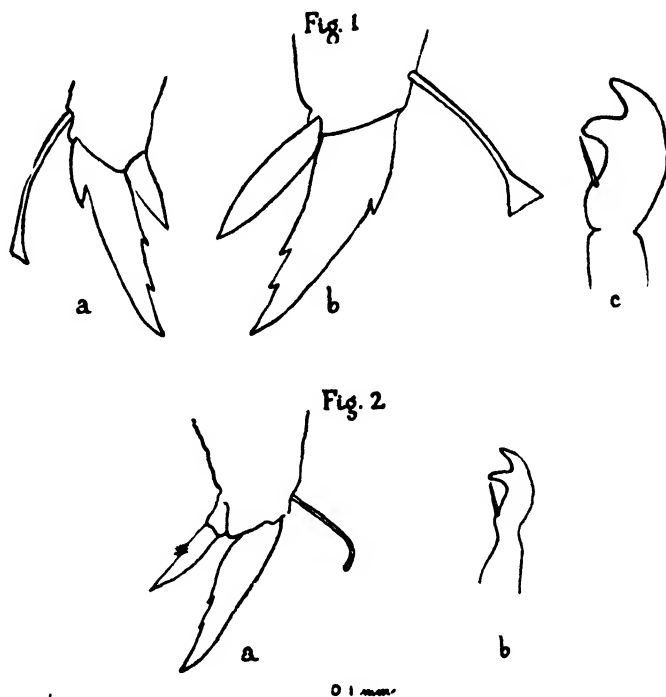


FIG. 1. *Lepidocyrtus paradoxus* Uzel.
a, Fore foot; b, Hind foot; c, Mucro.

FIG. 2. *Lepidocyrtus cyaneus* Tullberg.
a, Hind foot; b, Mucro.

Lepidocyrtus anglicanus n. sp.

Antennal segments I, II, III, IV = $1\frac{1}{2}$, $2\frac{1}{2}$, 2, $3\frac{1}{2}$. Head scarcely overhung by mesonotum (fig. 3a), which bears the usual tuft of setae on its anterior margin.

Abd. III, abd. IV=1, $3\frac{1}{2}$. Unguis with three teeth on the inner margin, and an apparently median tooth on the outer margin not so near the base as the paired outer teeth of *L. paradoxus*. Tenent hairs of the first pair of feet slightly expanded distally, the expansion being confined, as in the fore feet of *paradoxus*, to the ventral edge of the hair (fig. 3b). Tenent hairs of second and third pairs of feet not (sometimes very slightly on the third pair) dilated at the apex, but with the distal ends deflected ventrally (figs. 3c, 3d). Mucro (fig. 3e) with a short, thick, basal spine with its base set close to the anteapical tooth. Mucro, dens, manubrium= $\frac{1}{2}$, $6\frac{1}{2}$, $5\frac{1}{2}$. Head, antennae, legs, and furca rather densely pilose, as compared with those of *L. cyaneus*. Colour of the living animal dull, dark blue; without the scales, azure.. White intersegmental bands, and a few white flecks and dashes on the body segments. Head yellow, darker above, with no yellow stripe on the forehead. Eyes on a black patch. Basal segment and basal two-thirds of second segment of antennae, yellow; the remainder bluish. Legs, dentes, and last two abdominal segments, yellow; manubrium light bluish. Length 1.8 mm.

Loc. Wicken Fen, Cambridgeshire, England.

Two specimens were taken, and two more were seen but escaped, on the 29th January and the 3rd February, 1926. Further visits produced no more. They were obtained by scraping out moss, soil and mortar from the chinks of an old wall standing in a moist field at the east side of the Fen. All the specimens were about the same size.

Type in the British Museum.

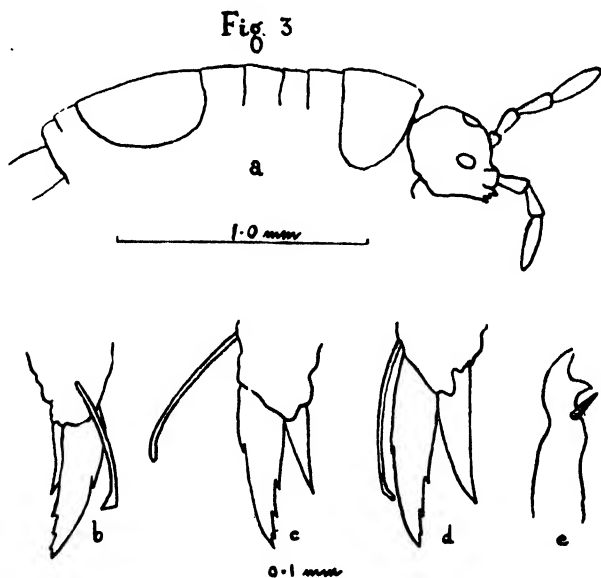


FIG. 3. *Lepidocyrtus anglicanus* n. sp.
a, Head, antennae, and trunk segments; b, Fore foot; c, Mid foot;
d, Hind foot; e, Mucro.

THE INDUCTION OF MELANISM IN THE LEPIDOPTERA AND ITS
SUBSEQUENT INHERITANCE.

BY G. T. PORRITT, F.L.S.

Under the above title Drs. J. W. H. Harrison and F. C. Garrett recently submitted a paper to the Royal Society, which is published in the Proceedings of that Society, B. Vol. 99, 1926, pp. 241-263. As the paper is likely to be seen by comparatively very few lepidopterists, it seems advisable that some comment on it should appear in a purely entomological journal. Briefly, the authors' theory is that Melanism is caused by the larvae, when feeding, assimilating metallic salts which have contaminated the food-plants, through their deposition on the plants from smoke in manufacturing and urban districts; and it occurred to them that, by introducing such salts into the water in which they placed the stems of the twigs containing the foliage on which the larvae fed, similar results might be obtained. The salts they used for the impregnation of the water were lead nitrate and manganous sulphate, and the species chosen for the experiments were *Selenia bilunaria* and *Tephrosia bistortata*. Of the former they state that no melanic form has ever been found wild, and melanic forms of *T. bistortata* (the old *crepuscularia* of our cabinets) have only been reported from Wales. In four years time they succeeded in obtaining black strains of both species. Moreover, larvae from the black strains, afterwards fed from the egg again on pure food, still produced melanic specimens, thus confirming their anticipation that the induced Melanism was not only inherited, but inherited as a Mendelian recessive (p. 254).

The paper is no doubt interesting and valuable as showing that Melanism can be induced by artificial means, but there are so many contradictory anomalies in connection with the subject that I think I shall be able to show that lepidopterists generally will require a good deal of further explanation before they can admit that the authors have advanced (if at all) our knowledge of the real cause or causes of Melanism in nature by more than a very small amount.

On reading the paper the obvious thought occurred that if *S. bilunaria* is so readily susceptible to the melanic influence as the authors claim to have proved, how is it that the species where occurring in localities where Melanism is prevalent, and where consequently the larvae must feed on food contaminated with the salts inducing it, has completely resisted such influence? The

following facts, however, show that Melanism *has* been produced in the species on wild gathered natural food. About a year ago I paid a visit to my friend Mr. W. Mansbridge at Liverpool, when he showed me a number of melanic specimens of this very species, which he had obtained by selecting the darkest offspring from a single ordinary female moth which he had captured in Delamere Forest. From the eggs laid by that female, quite contrary to his expectation some specimens of the moth in the following spring brood were darker than the parent, and although the summer broods were not affected, by breeding from the darkest and strongest specimens of the spring broods, darker specimens appeared each year, so much so that the fourth generation (from the spring emergences) gave a number of very dark unicolorous brown examples, though not so black as were those obtained by Drs. Harrison and Garrett. I believe that Dr. Harrison has seen Mr. Mansbridge's specimens, and attributes the change to the larvae having been fed on the Liverpool contaminated food. But if so, I can only repeat, why has it never succumbed to the melanic influence under absolutely natural conditions, as so many other apparently less likely species have done?

The authors of the paper assume—nay, assert (p. 242)—that where Melanism occurs the atmosphere is polluted more or less largely by smoke; whereas surely every lepidopterist in Great Britain who has at all seriously studied the geographical range of Melanism knows that such is not the case.

A striking instance of what I have termed contradictory anomaly is the distribution in Yorkshire of the ordinary pale and melanic forms of *Acronycta menyanthidis* and *Fidonia atomaria*. On the moors around this neighbourhood these two species are abundant, and *atomaria* has for many years been gradually increasing in Melanism, so that at the present time a very considerable percentage in both sexes are brown-black or black, in many without markings, in others practically so, whilst all the males are darker than the typical form. On the same moors, with these dark *atomaria*, *menyanthidis* is on the wing at the same time, but up to some five years ago a melanic specimen of it had never been seen. As I stated in 'Yorkshire Lepidoptera,' the species was 'almost invariably of the palest form we know in Britain, and a black specimen was never seen.' About five years ago a black specimen was found, and since then one or two specimens have, I think, been taken each year; some six or eight in all, and no doubt in the future it will become common. Yet on the heaths at

Skipwith near Selby, and at Strensall near York, both districts in which there is comparatively little smoke as compared with here, *menyanthidis* has, apparently as many years back as anything has been known about it, been so entirely of the black form that the Rev. C. D. Ash (formerly Vicar of Skipwith) tells me that probably not two per cent. of the pale form are to be found there. Mr. Samuel Walker of York also informed me that the same thing obtains at Strensall, and that no specimen is ever seen so pale as the South-west Yorkshire moth. Yet in those two districts the *Fidonia atomaria* are of the most ordinary typical forms; nothing approaching Melanism has ever been seen there. Will Dr. Harrison explain to us why larvae of the pale *menyanthidis* at Huddersfield, feeding alongside the larvae of the melanic *atomaria* and at the same period of the year, have not until so very recently been in the least altered by the influence causing Melanism; and why the larvae of the pale *atomaria* at Skipwith and Sandburn, feeding with the larvae of the melanic *menyanthidis*, have also up to now resisted its influence?

A further instance occurs in the dark unicolorous form of *Cidaria populata*, which is common at Rannoch and other similar districts in Scotland. Here at the time it is out *populata* occurs in thousands on our moors, but I have never yet seen on them a single specimen showing any sign of Melanism. Yet at Rannoch there is probably as little pollution of the atmosphere by smoke as can be found in any part of Great Britain. A parallel case is that of the melanic male variety *thulensis* (*hethlandica*) of *Hepialus humuli* in the Shetlands. In an absolutely clear atmosphere the form is abundant there, whereas here, although swarming almost in the midst of our dense smoke, our males are invariably of the purest white. There is, in fact, plenty of Melanism in the purest atmosphere of Scottish localities, and in the case of the variety *infusca* of *Xylophasia polyodon* (*monoglyph*), the form appears to have been plentiful there even at the time it was regarded as a comparative rarity in our smoky districts, although it is now abundant enough here and in other, even quite rural, districts. Take again the variety *edda* of the Shetland *Noctua glareosa*, a striking example of Melanism, which although a very common moth here, remains of quite the ordinary form, relieved only occasionally by the pretty var. *rosea*. True, the first specimen of var. *edda* (not then named, of course) was taken near Barnsley, and was sent to me for determination, its captor being unable to make anything of it (see E.M.M., Jan. 1874, p. 180). I

saw at once that it was a dark *glareosa*, and it was in fact exactly of the form *edda* which was afterwards turned up so freely in the Shetlands. But I have never seen or heard of another Yorkshire specimen of the variety. *Rusina tenebrosa*, too, is considerably darker at Rannoch than is our Huddersfield moth, and the same can be said generally of the *Hadena adusta* there, although some of our specimens do perhaps equal them in depth of colour. Both, as is well known, are darker than the South of England forms. As a contrast, the Rannoch *Acronycta leporina*, although sitting side by side on the sugared trees with these melanic forms, is as pale as any that can be found in the South of England, and much paler than the Yorkshire or Lancashire moth. I remember, indeed, that I was almost startled when I saw the first specimen at sugar at Rannoch, as it looked under the light of the lamp an absolutely white moth. •

A further anomaly is that we have in this district species which are actually much *paler* than in comparatively smokeless localities. A striking illustration of this is found in *Cidaria suffumata*, of which probably half the captured specimens are of the ordinary well-known form, but the others are brighter and paler, varying in a complete natural gradation and culminating in the black-and-white var. *porriti*. Anything approaching the dark brown unicolorous var. *piceata*, which is common further north in England and in Scotland, has so far as I know never been seen here, nor have, I believe, our pale forms been seen where the var. *piceata* occurs. Similarly, our *Arctia menthastri* (old nomenclature) are of the most ordinary type, whereas in some parts of Scotland the smoky-brown var. *brunnea* is plentiful.

I had jotted down the names of other species of the many more that could be instanced in support of my contention, but have written enough, I think, to show that Drs. Harrison and Garrett have still a good deal to do before they convince lepidopterists that they have found the solution of the cause of Melanism. I am with them to this extent, that I *do* believe there is *some* connection between smoke and Melanism. When one finds, for instance, that the var. *nigrosparsata*, which is (and not the var. *varleyata*) undoubtedly the real melanic form of *Abraxas grossulariata*, is here practically confined to the town gardens, and is almost non-existent in the country gardens only a few miles out of the town, one cannot avoid the conclusion that there is something to be said for it. This variety twenty years ago had never been observed here, but after it did appear its advance was so rapid that in a

few years it became comparatively common. Then came a year in which, for some unknown reason, the species became apparently almost wiped out in the district, and for several succeeding years was scarce. Now it is becoming plentiful again, but *nigro-sparsata* is as yet only got in very casual specimens, and it will apparently be some years before it regains its former strength.

There may possibly be more than one cause of the phenomenon of Melanism, and the theory of Drs. Harrison and Garrett is at any rate as plausible as any of the several that have been advanced, and a considerable advance on the earliest, that it was caused by the elimination by birds of the pale forms on the smoke-blackened trunks of trees, the darker specimens escaping owing to their less conspicuousness, a theory to which I could never subscribe. But when one finds so many instances of Melanism in districts where the atmosphere is perfectly pure, and the comparative paucity of cases, so far as our knowledge extends, in other districts, such as some parts of Staffordshire, Warwickshire, and South Wales, where there is possibly more dense smoke deposited on the vegetation than there is even in South Yorkshire and the industrial parts of Lancashire, I cannot feel that as yet we really know much more about its cause in Nature than we did fifty years ago.

Elm Lea, Dalton, Huddersfield.

April 10th, 1926.

ANOTHER CASE OF REDUCED WINGS IN A MALE SCIARINE FLY
(DIPTERA, MYCETOPHILIDAE).

BY F. W. EDWARDS.

(British Museum, Natural History.)

In a previous issue of this Magazine (Vol. xlix, September 1913, p. 209) I described under the name *Sciara semialata* an interesting fly in which the wings of the male were very much reduced, while those of the female remained normal. Only one similar case had previously been noted, namely *Sciara biformis* Lundbeck, from Greenland. I can now describe another instance of such reduction in a species which is quite distinct from *S. semialata* and probably also from *S. biformis*. Owing to the palpi having only one segment, this apparently new species is excluded from the genus *Sciara* in the restricted sense; it appears to come nearest to *Hyperlasion* Schmitz, and may be placed in that genus provisionally. For this very interesting material the Museum is indebted to Mr. E. R. Speyer, of the Cheshunt Experiment Station.

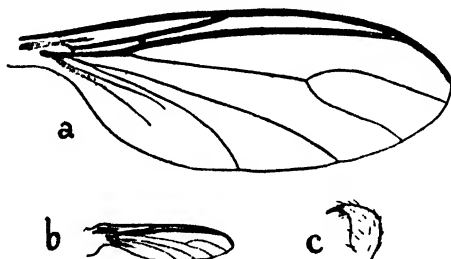
Hyperlasion curtipennis, sp. n.

Colour not ascertainable with certainty owing to the immaturity of the specimens; apparently the body is blackish, palpi and legs light, halteres dark.

Eye-bridges in contact but very narrow, and containing only about 6-10 facets (rather more in the ♂) which are irregularly arranged. Eyes nearly bare. Antennae similar in the two sexes, those of the ♂ a little stouter; flagellar segments only a little longer than broad. Palpi composed of a single segment, which has a rather small and inconspicuous patch of sense-hairs in front. Thorax with short and inconspicuous hair; the acrostichal series running practically the whole length of the mesonotum; scutellum with several short marginal hairs. Abdomen moderately slender. Tergites 4-8 in ♀ feebly chitinised in the middle. Hypopygium of ♂ not large; no ventral hair-patch; claspers short, somewhat tapering at the tip, which ends in a single sharp, strong spine. Legs short, especially those of the ♂, in which sex the femora are somewhat thickened, the anterior pairs being barely four times as long as their breadth in the middle. Tarsal segments 2-4 in the ♂ only about as long as broad, in the ♀ rather longer. Tibial spurs normal, short; no hind tibial comb. Claws simple; pulvilli and empodium barely distinguishable. Wings nearly clear, those of the ♂ very short and narrow, hardly reaching the third abdominal segment, those of the ♀ fully developed normal. Venation (of ♀): *R*₁ distinctly longer than *R*, but at the same time ending far before *fM*. Costa reaching the wing-tip and extending quite three-fourths of the distance from *R*₅ to *M*₁. *R*₅ ending above tip of *M*₃. Median fork shorter than its stem; stem of cubital fork about half as long as the basal section of *M*. *An*. long but faint; anal angle very obtuse. In the ♂ wings of venation appears similar to that of the ♀, the media and cubitus in all specimens examined being distinctly forked, but the anterior veins are crowded towards the costa and not easily traceable. Halteres normal in both sexes.

Length of body (extended), ♂ 2.2 mm., ♀ 3.5 mm.; wings, ♂ 0.7 mm.; ♀ 2.2 mm.; antennae, ♂ 0.7 mm., ♀ 0.9 mm.

Clacton-on-Sea, Essex, 28 xii 1925, 'larvae in large aggregates in soil of tomato house' (E. R. Speyer).



Hyperlasion curtipennis, n.sp.

a. Wing of ♀, ×25; b. Wing of ♂, ×25;
c. Clasper of ♂, ×65.

The material sent by Mr. Speyer included larvae and pupae of the normal Sciarine type, the pupae lacking the facial spines which are present in some of the large species of *Sciara*. It is of interest to note that the reduction of the male wings is observable even in

the pupa, the wing-pads in the male sex being shorter than the leg-cases, whereas in the female they are fully as long.

H. curtipennis has not carried the reduction of the male wings quite so far as *S. semialata*, since the venation, and particularly the median fork, is fairly well preserved. In this respect it resembles *S. biformis* Lundb., but the venation of the ♀ is different, Lundbeck's species having R₁ rather shorter instead of longer than R.

The collector sends the following notes upon the habits of the new species:—

On December 20th, 1925, some soil containing numbers of larvae were received from a tomato-house at Clacton-on-Sea. The soil was placed in a glass jar and kept moist. A few days afterwards all the larvae, which are of a yellow colour, had collected into a single mass, and reports from the tomato-grower from whom they were received show that they are found in the soil in this condition, the masses often being of very considerable size.

By January 25th, 1926, the pupal stage had been reached, the yellowish pupae massed together being unprotected by any form of cocoon, and lying near the soil surface.

Great numbers of adults emerged on January 29th, mostly, but not quite all, being females. The next day the whole of the rest of the pupae emerged, all being males. The flies were weak and showed no wish to use their wings, and the males are probably incapable of doing so. Copulation was observed immediately after emergence of the males, and eggs were laid, some twenty-five in number by each female on the glass of the jar. Unfortunately these eggs did not hatch subsequently and no eggs were obtained from isolated females placed on fresh soil.

Large masses of larvae were again reported on March 18th from the same locality, and great difficulty was experienced last year in raising tomato-plants upon the soil where these larvae were found. Sterilisation of the soil with cresylic acid has rectified this and the numbers of larvae have been reduced by this treatment. It is not certain, however, that the larvae are root-feeders, and they may subsist on organic matter in the soil.

As the larvae reared to maturity were collected in winter, and did not appear to grow, it is probable that they were hibernating, and reach a full-fed stage in autumn.

They are especially suitable objects for microscopic study, as, if preserved in picric-nitric acid, they are easily dissected in alcohol and the internal organs stain brilliantly with borax carmine, less so with paracarmine.

British Museum (Natural History).

March 1926.

A melanic variety of a common fly (Anisopus cinctus F.).—A short time ago [Ann. Mag. Nat. Hist. (9) xii, p. 476, 1923] I described under the name *withycombei* a peculiar female *Anisopus* (*Rhythus*), taken in north-east London, which while exhibiting the structural characters of the common *A. fenestralis* and *A. cinctus* differed strikingly in colour, the body and legs being blackish, the well-known wing-markings suffused in a general smokiness, and the whole stigmatic area of the wing black instead of having the usual yellow interruption

in the middle. The specimen was previously regarded as a melanic variety of *A. fenestralis*, pending the discovery of a male. Now the desired male has turned up, one having been taken at Coventry, 1.vii.1925, by Mr. J. W. Saunt, who has kindly presented the specimen to the British Museum. This male is precisely like the female in colour; in genital structure it proves to be identical with *A. cinctus* F., as restricted by me in 1923. That it should thus prove to be a melanic form of *A. cinctus* rather than *A. fenestralis* is somewhat surprising, since *A. cinctus*, though very variable in colour, is in general apt to be lighter than *A. fenestralis*.

The fact that only these two examples have been found suggests the possibility that it may be a recently developed form, perhaps analogous to the cases of 'industrial melanism' familiar to lepidopterists. It is to be hoped that collectors will keep a look out for this insect on their windows and elsewhere in order to ascertain if it is really more common than is supposed or if it becomes so. I may remark that it is more likely to be confused with *A. punctatus* than with *A. fenestralis*, and in order to assist in its recognition I offer the following key to the European species of *Anisopus*. (Two of these, *fuscatus* and *limpidus*, have not yet been found in Britain, but are included in case they should be found here in the future. *A. fuscatus* has been recorded by earlier authors, but all British specimens I have seen so determined proved to be *A. punctatus*.)

1. Wing-tip clear; cell *M*₁ (second posterior) pointed at base 2.
Wings with a dark spot or shade at the tip; cell *M*₁ square at base 3.
 2. A dark spot or cloud near base of cell *R*₅ (first posterior); ♂ eyes touching *punctatus* Mg.
Cell *R*₅ clear; ♂ eyes narrowly separated *fuscatus* Mg.
 3. Femora dark; stigma all blackish *cinctus* var. *withycombei* Edw.
Femora mainly yellow; stigma yellow in middle 4
 4. Legs all yellow, body mainly so; wing-markings faint *limpidus* Edw.
Femora and tibiae dark at tip; abdomen with dark bands or mainly dark; wing-markings distinct 5.
 5. Eyes of ♂ almost touching; hind femora without dark ring in middle *zetterstedti* Edw.
Eyes of ♂ well separated; hind femora with traces of a dark ring in the middle 6.
 6. Thorax always with three blackish stripes; ♂ hypopygium with broad black ventral piece; clasper with basal tooth *fenestralis* Scop.
Thorax variable, in ♂ often all yellow; ♂ hypopygium with narrower and less black ventral piece; claspers without basal tooth; size averaging smaller and wing-markings less dark than the last *cinctus* F.
- F. W. EDWARDS, British Museum (Nat. History): *March* 1926.

Note on the Coccinellid genus Arrowella Brèthes.—During a recent study of various exotic Coccinellids in the British Museum, I had occasion to examine the unique type of this genus, *A. porteri* Brèthes (An. Mus. Nac. Hist. Nat. de Buenos Aires, xxxiii, pp. 147, 148, 1924) from Araucania, S. Chile, and find that it is undoubtedly a specimen of *Adalia bipunctata*, var. *sexpustulata* Linn. ! It was received in 1907 with eighty-three other Coleoptera from Mr. R. M. Middleton, but whether some mistake had been made by him in labelling, or whether the insect was actually captured in S. Chile, it is impossible to say. The ubiquitous *A. bipunctata* in its various forms is common to the whole Holarctic region, but I have seen no southern record of it.—G. C. CHAMPION, Horsell April 1926.

Note on Atheta depressicollis Fauv. : a correction.—In Vol. lxi, 1925, p. 155, of this Magazine, I recorded *Atheta depressicollis* Fauv. as occurring in this country. Further examination of the material, however, has shown me that it is not this species. On the other hand, although very similar to *A. nigricornis* Thoms., the insect in question differs from the latter in the narrower build and the much less developed thoracic impression. It appears probable that it will be found in collections mixed with *nigricornis*. The question arises as to whether it is the *excavata* of Gyllenhal recorded from Sweden and Great Britain in the last European Catalogue, and by Fenyès (Gen. Insect., Staphylinidae, Aleocharinae, p. 211). The description of it given by Gyllenhal however would apply quite well to *nigricornis* Thoms.—M. CAMERON, 75 Teesdale Road, Leytonstone, E.11. : April 6th, 1926.

British localities for Cerycon (Cercyon) minutus F., C. lugubris Pk. and C. sternalis Sharp.—When working at *Cercyon* for my forthcoming book I had to read up Dr. Sharp's paper on these insects (E.M.M. 1918, pp. 274-277), specimens of which have very kindly been sent me for examination by Mr. J. Collins. As there are so few localities given for the above species I ought to record those in my collection : *C. minutus*, 2, Pagham Harbour, Sussex ; *C. lugubris*, 3, Banghunt, Berks ; *C. sternalis* (?=*subsulcatus* Rey), 2, Thurlestone, S. Devon ; Bradfield.—NORMAN H. JOY, Reading : April 4th, 1926.

Coleoptera in the sea.—One of my friends, the Rev. Michael Champneys, M.A., Vicar of Hundon, Suffolk, told me (and subsequently put in writing) the following account of sailing through large numbers of Staphylinid beetles, which were struggling and apparently drowning, several miles from the coast of Suffolk, in August 1925. Mr. Champneys, though not a Coleopterist, is a reliable observer of nature and also a keen lover of sailing. He writes, Oct. 9th, 1925 : ' the adventure of the ' devil's coach-horses ' occurred on August 17th in the near neighbourhood of the Cork Light Vessel, which lies about two and three-quarter miles from the Suffolk coast, midway between the Stour-Orwell and the Deben river estuaries. The weather was nearly calm—very light breeze from S.W. ; tide (approaching springs) about two-thirds ebb, the ebb setting E. by N. parallel with the coast. The creatures were in very considerable numbers and we sailed through them for perhaps a quarter of a mile. Tide conditions might have favoured their drifting out of the Stour, Orwell, or Hamford Water to the point at which we encountered them, though that would be rather a long drift for the time, viz. about four hours from high water.' Mr. Champneys unfortunately took no specimens, but told me that they appeared to him to be very like the common ' devil's coach-horses ' seen in gardens.

The Rev. C. E. Tottenham, on hearing the above observation narrated, recalled that he had found quantities of *Gastroidea polygoni* L., washed up by the tide on the beach at Bridlington, Yorks., on June 17th, 1924 ; he has sent me these particulars from his notes, and has kindly allowed their publication.—HUGH SCOTT, University Museum of Zoology, Cambridge : April 7th, 1926.

[In the late summer of 1869, when Coccinellidae appeared in great profusion in East Kent (cf. Proc. Ent. Soc. Lond., 1869, pp. xxv-xxvi), large swarms consisting of at least half-a-dozen species were blown off the land, and falling into the Thames estuary, were washed up by the tide on the foreshore of the Isle of Sheppey. The drowned beetles formed a ' thin red line ' at high-water mark, an inch or more in depth, for an extent of a couple of miles at least, and many millions must have perished on this occasion. This phenomenon has

since been repeated more than once on a smaller scale, but as far as I am aware not in very recent years; indeed, on my later visits to Sheppey I found 'ladybirds' much less numerous than they had been half a century previously, perhaps owing to the extended practice of spraying the hops, and the consequent scarcity of Aphides. (Cf. also Ent. Mo. Mag., vol. vii, p. 12 [1870]).

At Sydney, N.S.W., I used to find it highly remunerative to search the ocean beaches at Bondi, Coogee, etc., for Coleoptera blown out to sea and washed up after the incidence of a 'Southerly Buster' in summer (cf. Ent. Mo. Mag., Vol. xli, p. 219), and my friend Mr. H. J. Carter informs me that this practice, locally known as 'beach-combing,' is now regularly followed by the resident Coleopterists, who thus obtain a good many scarce species that are otherwise difficult to procure.

Reference may also be made to Charles Darwin's record of his taking several species of living beetles with the towing-net in the open sea, seventeen miles off the coast of Patagonia (Journal of Researches, ed. 1901, p. 158).—J. J. WALKER.]

A rare variety of Chrysophanus phlaeas L. in North Wales.—On August 11th, 1925, on some hills near the coast some miles south of Barmouth, I saw a specimen of the Small Copper with whitish, instead of coppery, colour in the wings. I had no net and was unable to capture the insect, but it settled on the ground in front of me more than once, allowing a close inspection. I am sure that it was not a faded example of the ordinary form, but a specimen of the variety *schmidtii* (cf. South, Butterflies of the British Isles, 1st ed., 1906, pl. 101, fig. 7) or of a closely similar form. A large piece had been taken out of both the fore and the hind wing on the right side. I noted these data at the time in my diary.—HUGH SCOTT.

Lycaena arion—an appeal for its preservation.—The Committee appointed by the Entomological Society of London to secure the preservation of certain species of British Lepidoptera whose existence is at present threatened, are taking measures which it is hoped will assist the Cornish race of *Lycaena arion* to maintain itself. They are satisfied it still lives in certain of the localities where it was abundant twenty or thirty years ago, though in greatly reduced numbers. They are of opinion that if this race, the finest of all British local forms, of our, in certain respects, most interesting and beautiful butterfly, is to continue to exist, it is absolutely necessary that collecting of it should cease until the stock is replenished. They therefore appeal to all entomologists to assist by every means in their power to protect it for the present by not collecting specimens themselves, and by using their influence with those who would otherwise do so. There seems very little doubt but that *L. arion* if sympathetically treated will in a few years attain much of its former abundance. Entomologists who contemplate visiting N. Cornwall for the purpose of collecting other insects will assist the Committee and avoid difficulties by writing to me. I will then put them in touch with residents who are interested in the preservation of this butterfly.—H. M. EDELSTEN, Hon. Sec., Hillside, Lindfield, Sussex: April 8th, 1926.

A new locality for Pachycoleus rufescens Sahlb.—In March 1925, at Cothill near Abingdon, Berks., Mr. E. G. R. Waters casually picked up a little tuft of damp-moss to pack a box containing something for Mr. A. H. Hamm. On turning out the contents of the box Mr. Hamm noticed a small bug running actively about. He immediately brought it to me alive, and on referring to the collection of the late Edward Saunders, now in the Oxford University Museum, the insect proved to be *Pachycoleus rufescens* Sahlb. and an import-

ant addition to the Oxford list of Hemiptera. Mr. Waters kindly supplied the information as to where the moss came from, a locality which happened to be well-known to me, so I visited the spot indicated on several occasions last year without success as regards the insect. On April 3rd, 1926, after an hour's close search, I was rewarded by finding two specimens of *P. rufescens* about a dozen yards from where Mr. Waters accidentally took his examples. *P. rufescens* has only so far been recorded from the three counties of Devonshire, Hampshire and Berkshire. It was first taken at Dawlish by Mr. P. de la Garde (E.M.M., xliv, p. 8) and introduced by Mr. G. C. Champion as new to Britain. It was also taken in the New Forest by Dr. D. Sharp and G. C. Champion (E.M.M., xlix, p. 187), who unfortunately lost the tube containing most of their captures. *Pachycoleus* may quite easily be overlooked on account of its small size, 1 mm. in length, it being the smallest-known British Heteropteron.—J. COLLINS, 74 Islip Road, Oxford: April 1926.

Aphodii hibernating in rotten wood.—While collecting at Yarnton, Oxon., in March 1926, I broke up part of a rotten willow lying on the ground and found upwards of a score of *Aphodii* which had burrowed into the soft damp wood and had wintered there. They were all more or less common species, viz.: *A. fimetarius* L., *A. fossor* L., *A. rufipes* L., *A. ater* DeG., *A. haemorrhoidalis* L., *A. punctato-sulcatus* Stm., and *A. prodromus* Brahm. The usual winter quarters for most of these is in the earth under cow-dung.—J. COLLINS.

On the occurrence of Lagopus affinis Children in Eastern Siberia.—Through the kindness of Dr. Malcolm Burr I have recently examined two males of the above Mallophagous species taken from a grouse (*Lagopus* sp.), Bodaibo, River Vitim, near Lake Baikal. The type of Children's species [from Willow Grouse (*Lagopus saliceti*), Arctic America, Capt. Back, R.N., collection] is still extant in the British Museum collection. The interest of the present record is that it fills one of the last of the major gaps in our knowledge of the distribution of *L. affinis*, and confirms the view that the species will prove to be confined to one genus of Grouse, viz.: *Lagopus*.—JAMES WATERSTON, British Museum (Nat. Hist.): April 1926.

A Braconid new to Britain.—Among a number of Braconidae recently sent to me for identification by Dr. W. J. Fordham of Gateshead, I was much interested to find a male of *Microgaster nobilis* Reinh.* a species hitherto recorded from France, Germany and Hungary only. Dr. Fordham's specimen agrees exactly with the original description, excepting that the disc of the second abdominal segment is black and not red, and the wings can scarcely be described as infumated at the tips. However, these are characters which are very liable to variation, and I have no doubt that I have correctly identified the insect. With its conspicuous red and black abdomen, having the second segment smooth and shining, and mainly red legs, it is not likely to be mistaken for any other species of *Microgaster* in which the first abdominal segment is little, if any, longer than broad. The excavations at the base of the first segment are very pronounced. The female of this species is still unknown. Dr. Fordham informs me the specimen was in an old collection of British insects formerly the property of the late William Hewett of York, and was set low down on an old-fashioned, large-headed, entomological pin. My friend Mr. G. T. Porritt tells me that Hewett set all his captures in this manner and that he collected insects of several orders, working principally in the neighbourhood of

* Deutseh. Ent. Zeitschr., vol. xxiv, p. 355 (1880).

York. Unfortunately this unique British specimen is much damaged, which is not surprising when the method of mounting is considered; it has lost one antenna entirely, part of the other and three legs.—G. T. LYLE, Briarfield, Shibden, Halifax : *March 26th, 1926.*

A new quarterly periodical.—The 'North-Western Naturalist,' Vol. I, pt. 1, dated March 1926, is in our hands. It is edited by A. A. Dallman, in collaboration with H. Britten, G. H. Carpenter, F. H. Green, J. W. Jackson, C. L. Walton, F. E. Weiss and A. Wilson. The contents of this first number include papers on Algae, Ornithology, Entomology, Meteorology, etc., reports of societies, reviews, etc. The three entomological contributions are as follows : (1) 'The Crane-flies of Carnarvonshire,' by H. F. Barnes; (2, 3) 'Ants and Sundew,' and a 'Pentatomid bug preying on beetle larvae,' by H. Britten. The last-named author records *Myrmica laevinodis* removing the remains of a dragonfly (*Pyrrhosoma nymphula*) victim sticking to the leaf of a sundew (*Drosera rotundifolia*), and *Rhacognathus punctatus* as found sucking the larvae of a Chrysomelid, *Hydrothassa marginella*, seen feeding in large numbers on *Caltha palustris* at Skirwith, Cumberland. The larva of a delicate plume-moth, *Trichoptilus paludum* Zell., is known to live on *Drosera*, and even to devour the viscid glands with impunity (cf. Chapman, Trans. Ent. Soc. London, 1906, p. 133). The annual subscription for this new venture is 7/6 per annum, payable to F. H. Green, 86 Old Chester Road, Woodhey, Rock Ferry, Cheshire.—Eds.

SOME INDIAN (AND TIBETAN) COLEOPTERA (19).

BY G. C. CHAMPION, F.Z.S.

The nineteenth contribution to this series is devoted to the enumeration or description of various Telephorids, five species of which were noticed in my last paper (E.M.M., November 1925, pp. 264-266). To study these Himalayan forms it has been found necessary to examine all the available material from Sikkim and Tibet (including several species obtained by Major R. W. G. Hingston during the 1924 'Everest Expedition'), Assam, Upper Burma, etc., in the British Museum, as well as Hope's 'Nepalese' types and co-types in the same Museum or at Oxford. The latter I hope to re-describe as opportunity offers, most of these insects having been ignored by modern writers. Unfortunately the types of Gorham and Pic are not available for examination by students in this country.

The Nepalese Telephorids named by Hope in 1831 are as follows (the two included in the 'Munich Catalogue' are marked with an asterisk):—

Omalysus maculicollis = *Lycocerus serricornis* Gorh.

Omalysus lineaticollis = a *Lycocerus* nearly allied to the above.

Telephorus nepalensis * is here referred to *Themus*.

T. rubricollis, *cyanurus*, *trimaculatus* and *unipunctatus* (the two

last-named equalling vars. of *T. coeruleomaculatus* Koll. and Redt., etc.) can be placed under *Athemus* Lewis (1895); allied eastern forms with one or two of the tarsal claws similarly hamate in ♀ were referred by Gorham in 1889 to *Ancistronycha* Muls.

T. purpurascens is a *Podabrus*, both sexes of which are here described.

Anisotelus lividus, *bimaculatus** and *bispilotus* are forms of a single *Tylocerus*, for which the first name (*lividus*) should be used. The variation in the development of the ♂ antenna has been described by Bourgeois.

[The true Lycids and Lampyrids have been enumerated under their modern genera by C. O. Waterhouse and E. Olivier respectively; *Telephorus assimilis*, as I stated in 1919, is an *Idgia*; *Malachius bifasciatus*† belongs to *Hapulochrus* and = *H. fasciatus* F.]

The species enumerated in the present paper are as follows:—

<i>Podabrus purpurascens</i> Hope.	<i>Themus ancoralis</i> , n. sp.
„ <i>marmoratus</i> Bourg.	„ <i>versicolor</i> Gorh.
„ <i>dromedarius</i> , n. sp.	„ <i>sikkimensis</i> Pic.
„ <i>fuscolineatus</i> , n. sp.	„ <i>venningi</i> , n. sp.
„ <i>annulicornis</i> , n. sp.	„ <i>khasianus</i> Gorh.
„ <i>tenuicollis</i> , n. sp.	„ <i>subviridipennis</i> Pic.
„ <i>cavicornis</i> , n. sp.	„ <i>stevensi</i> , n. sp.
<i>Anolis parallelus</i> , n. sp.	„ <i>cacharensis</i> , n. sp.
„ <i>hieroglyphicus</i> , n. sp.	[„ <i>bieti</i> Gorh.]
„ <i>abdominalis</i> Pic ?	„ (?) <i>chrysocephalus</i> , n. sp.
„ <i>ocularis</i> , n. sp.	„ <i>fuliginosus</i> Bourg.
„ <i>fumidus</i> , n. sp.	„ <i>puncticeps</i> , n. sp.
„ <i>rubicundus</i> , n. sp.	„ <i>inequalithorax</i> Pic.
<i>Stenothemus</i> (?) <i>refossicollis</i> Pic.	„ <i>praelongus</i> , n. sp.
<i>Themus nepalensis</i> Hope.	„ <i>hobsoni</i> , n. sp.
„ <i>chalybeipennis</i> Gorh.	„ <i>pindarae</i> , n. sp.
„ <i>crassimargo</i> , ♀ sp.	„ (?) <i>comans</i> , n. sp.

PODABRUS Westwood.

Podabrus purpurascens Hope.

Telephorus purpurascens Hope, in Gray's Zool. Misc. 1831, p. 26.

‘Violaceus, thorace rubro elytrisq. purpureis. Long. lin. 4½; lat. 1.’

♂. Very elongate, narrow, cinereo-pubescent, shining; head, palpi, antennae (the more or less infusate joints 3–11 excepted), prothorax, scutellum and legs testaceous, the elytra violaceous or cyaneous; the head and prothorax very sparsely, finely punctured, the elytra rugosely punctured and sub-granulate, with indications of two or three raised lines on the disc. Head grooved between the eyes, the post-ocular portion long and obliquely narrowed posteriorly, the eyes

† This synonym was omitted from my account of *H. fasciatus* published in October, 1920, also by Gorham in 1895.

moderately large, not very prominent; antennae (fig. c) very long, joint 2 short, 3-11 compressed and widened, 3-10 sub-equal in length, 11 one-half longer than 10 and angularly bent at about the basal third. Prothorax narrow, much longer than broad, gradually narrowing from the base and slightly constricted before the middle, the basal margin raised, hollowed at the middle; deeply excavate on each side anteriorly, broadly so on the disc before the base, and with an incomplete median sulcus. Elytra very elongate, much wider than the prothorax, sub-parallel. Lateral lobes of terminal (covered) ventral segment stout, curved, hollowed within, truncate at tip.* Posterior femora thickened; posterior tibiae curved; tarsi long, all the claws bifid at tip.

♀. Head less narrowed posteriorly, the eyes as in ♂; antennae (fig. a) shorter, slender, filiform, joint 11 straight, a little longer than 10; posterior femora not so stout.

Length $9\frac{1}{2}$ - $11\frac{1}{4}$ mm.

Hab. Nepal [type], Kakkar [Cachar], Gopaldhara, Kurseong (*Mus. Brit.*), 'E. India' (*Capt. Boys, in Mus. Oxon*), Nainital and Dudhatoli, Kumaon, alt. 7,000-9,000 ft. (*H.G.C.* : ♂ ♀).

This conspicuous Telephorid has not been identified by any of the various writers on the group since Hope's time. The above description is taken from a perfect pair from Kumaon. The ♂ has the lateral lobes of the terminal ventral segment shorter, stouter and more curved than in *P. alpinus* Payk., and simply truncate at tip. The elongate, basally-narrowed head separates *P. purpurascens* from *Rhagonycha*.

Podabrus marmoratus Bourgeois.

Podabrus marmoratus Bourg. Bull. Mus. Paris, viii, p. 425 (1902).

Hab. Sikkim, Darjeeling [type], Gopaldhara (*H. Stevens*).

A ♀ captured by Mr. Stevens agrees with the full description given. An extremely elongate, slender insect, testaceous above, with fusco-bivittate head and prothorax, and fusco-marmorate, flavo-lineate elytra, the prothorax long and narrow, the eyes large and prominent, the head much narrowed posteriorly. The tarsal claws are all bifid at the tip. Length 12-14 mm.

Podabrus dromedarius, n. sp.

♂. Extremely elongate, narrow, slender, shining, the head sub-opaque, pubescent; piceous, the antennae and legs obscure testaceous; the head and prothorax sparsely, finely, the elytra uneven and rugosely punctured. Head sulcate down the middle, binodose on the vertex, rapidly, obliquely narrowed behind the large prominent eyes, and produced into a narrow flattened neck posteriorly; antennae extremely elongate, slender, filiform, joint 3 one-half longer than 2, 4-8 very long, 9-11 a little shorter than the preceding joints. Prothorax long, narrow, narrowing from the base, hollowed down the middle

* Ganglbauer (in a posthumous paper published in the *Münch. Koleopt. Zeitschrift*, iv, pp. 71-75) uses the term 'parameren' for lateral lobes, and 'copulationsapparat' for the entire segment.

and on each side anteriorly, abruptly constricted before the apex and with the short, narrower anterior portion raised. Elytra extremely elongate, sub-parallel, much wider than the prothorax. Legs very long and slender; all the tarsal claws bifid at tip.

Length 11½ mm.

Hab. TIBET, Tropde alt. 11,000 ft. (*Major Hingston*: 23, vi, 1924).

A single specimen of this very elongate, slender, shining, fuscous insect was obtained by Major Hingston during the last 'Everest Expedition.' It is related to *P. marmoratus* Bourg. and *P. tenuicollis*, infra. There is an example of a similarly-coloured and sculptured, less elongate form (of the size of *P. marmoratus*), from Mungphu, Sikkim (*ex coll. Atkinson*), in the British Museum, too imperfect to describe.

Podabrus fuscolineatus, n. sp.

♂. Narrow, very elongate, depressed, shining, the head sub-opaque, closely pubescent; fuscous, the head before and behind the eyes, the basal joint of the antennae beneath and the others at the extreme tip, the palpi in part, and the prothorax with the sides in part, basal margin, and two spots or streaks on the disc, testaceous or flavous; the elytra testaceous or obscure testaceous, narrowly fusco-lineate; the legs testaceous, more or less fusco-annulate; the head closely, finely, the prothorax minutely, punctate, the elytra roughly punctured and costate or sub-costate. Head obliquely narrowed behind and produced into a narrow flattened neck, the eyes moderately large; antennae very long, slender, filiform, joint 2 much shorter than 3. Prothorax narrow, longer than broad, narrowed anteriorly, excavate along the sides before the middle and hollowed in the centre before the base, binodose on the disc posteriorly, the basal margin raised. Elytra very elongate, sub-parallel. Terminal (covered) ventral and the corresponding dorsal segment each with long lateral lobes, the ventral one hollowed and obliquely produced at apex, the dorsal one slender, the two forming a clasping-organ (visible when seen in profile). Legs long, slender, all the tarsal claws bifid at tip.

♀. Antennae a little shorter; eyes smaller.

Length 8-10 mm.

Hab. Pindar Valley, N. Kumaon, alt. 8,000-11,000 ft. (*H.G.C.*).

One ♂, two ♀ ♀. Less elongate than *P. marmoratus* Bourg., the prothorax smoother and with the dark dorsal space undivided, the elytra fusco-lineate, instead of being mottled with dark spots and streaks. The basally elongated head separates it from *Rhagonycha*.

Podabrus annulicornis, n. sp.

♂. Extremely like *P. fuscolineatus*, and very similarly coloured, the elytra usually more or less fusco-lineate; the eyes larger and more prominent; the elytra relatively narrower, very elongate, a little widened at the tip; terminal (covered) ventral segment with rather broad, spoon-shaped, slightly curved lateral lobes, the corresponding dorsal segment without lateral processes, the median lobe narrow, the sac (as seen everted) with a stout, strongly-curved hook.

Length 7½–9½ mm.

Hab. SIKKIM, Darjeeling, alt. 7,000 ft. [type] (*Miss Wetherall and Major Hingston*); TIBET, Tropde and Rongshar Valley, alt. 9,500–11,000 ft. (*Major Hingston*).

Eleven examples, three of the males examined exhibiting the copulatory structure above described. All of them were captured in June, 1924. This insect was at first supposed by me to be a form of the Pindar Valley *fuscolineatus* till the terminal abdominal segments of the male were dissected out and examined. Numerous allied Japanese forms have been described by Harold and Lewis.

Podabrus tenuicollis, n. sp.

♂ (immature). Very elongate, narrow, slender, moderately shining, pubescent; piceous, the head, prothorax, sutural and outer margins and base of elytra, base of femora, and tarsal claws pale testaceous; the head and prothorax very finely, the elytra densely, rugulosely, punctured, the latter with two faint raised lines on the disc. Head slightly hollowed between the large prominent eyes, rapidly, obliquely narrowed behind them, and produced into a narrow neck posteriorly; antennae very long, slender, filiform, joint 2 a little shorter than 3, 4–11 elongate. Prothorax narrow, elongate-triangular, much longer than broad, constricted before the middle, hollowed along the sides and also down the middle posteriorly. Elytra very long, much wider than prothorax, sub-parallel. Legs very long, slender; all the tarsal claws bifid at tip.

♀ (mature). Prothorax broadly piceous down the middle; eyes less prominent; antennae a little shorter.

Length 9 mm.

Hab. Sikkim, Gopaldhara near Darjeeling, alt. between 4,720 and 6,100 ft. (*H. Stevens*: ♀, type), Gantok, alt. 5,100 ft. (*Major Hingston*: i, v, 1924, ♂).

Two specimens, the mature ♀ treated as type. Less elongate than *P. marmoratus* and *P. dromedarius*, the suture and margins of the elytra testaceous, the prothorax as long and narrow as in *P. dromedarius*.

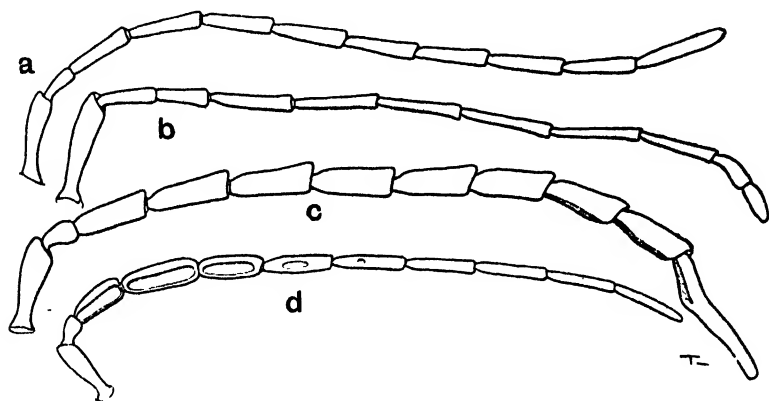
Podabrus cavicornis, n. sp.

♂. Very elongate, narrow, finely pubescent, dull, the prothorax shining; head black, the palpi, mandibles, basal four or five joints of antennae wholly or in part, prothorax, scutellum, basal margin of elytra, and abdomen in part, testaceous, the rest of the antennae, elytra, and abdomen nigro-piceous; the head closely, finely, the prothorax very sparsely, the elytra densely, rugulosely punctured, the last-named also finely costate. Head obliquely narrowed behind the eyes, the latter large and prominent; antennae (fig. d) long, tapering, joint 2 very short, 3–6 elongate, widened, and deeply sulcate along their inferior aspect, 7–11 filiform. Prothorax as long as broad, rather narrow, narrowed anteriorly, hollowed along the sides and in the middle posteriorly. Elytra very elongate, parallel or sub-parallel, wider than head. Legs slender; posterior tibiae curved; all the tarsal claws bifid at tip. Terminal (covered) ventral segment with long, sulcate, lateral lobes, which are produced externally into an elongate blunt rod, thus appearing bifid at tip; the everted sac (as seen protruding from the median lobe) spinulose.

Length 9 mm.

Hab. Nilgiri Hills (*H. E. Andrewes*).

Described from two perfect males, a third example of the same sex wanting the abdomen and antennae. The tapering antennae, with joints 3-6 widened and deeply sulcate, in ♂, is a character not previously noticed by me amongst the Telephorids.



a. Podabrus purpurascens Hope, ♀ ; *c. ditto*, ♂ ; *b. Themus hobsoni*, n. sp., ♀ ; *d. Podabrus cavicornis*, n. sp., ♂, from beneath.

ANOLISUS Mulsant.*

Anolisus parallelus, n. sp.

♂. Very elongate, narrow, shining, pubescent; testaceous, the eyes black, the abdomen (the anterior margins of the ventral segments excepted) nigropiceous; the head and prothorax closely, finely, the elytra rugulose punctured, the last-named also distinctly costate. Head broad, long, much narrowed behind the eyes, the latter large and prominent [antennae imperfect, joint 2 slightly infuscate]. Prothorax longer than broad, parallel-sided, slightly dilated towards the apex, broadly hollowed on each side before the middle and also mesially sulcate, the disc longitudinally swollen on each side of the central groove at about the middle. Elytra very elongate, parallel, wider than the head. Legs rather stout; tarsal claws each with a sharp tooth at base. Lateral lobes of terminal (covered) ventral segment fused exteriorly with the spoon-shaped broad dorsal lobes, the apices of latter twisted inward into a bilamellate hook; median lobe emarginate at tip.

Length 10 mm.

Hab. Sikkim, Rungbong Valley (*H. Stevens*).

One ♂, imperfect. Separable from *A. 7-notatus* Pic, which also occurs in Sikkim, by the uniform testaceous colour of the upper surface, the relatively longer, anteriorly-dilated, binodose prothorax, and the peculiar form of the ♂ terminal abdominal segments.

* Two species of *Anolisus* were enumerated in my last paper, cf. E.M.M. 1925, p. 264.

Anolis hieroglyphicus, n. sp.

♀. Narrow, slender, pilose, shining, the head opaque; pale testaceous, the head with a broad posteriorly narrowed space on the vertex and a narrow streak behind the eyes beneath, the antennae (except at the apex of each joint), the prothorax with an angulate, interrupted stripe on each side and three marks on the disc (one in the middle anteriorly and two near the base), tarsi, and under-surface in part, nigro-piceous or fuscous; the head and prothorax closely, finely punctured, the elytra rugulose and sub-costate. Head long, much narrowed behind the eyes, the latter prominent; antennae long, filiform, slender, joint 2 shorter than 3. Prothorax longer than broad, narrow, deeply arcuato-foveate on each side anteriorly and sulcate down the middle, the margins appearing strongly sinuate. Elytra long, narrow, sub-parallel, a little wider than the head. Tarsal claws each toothed at base.

Length $6\frac{1}{2}$ mm.

Hab. Sikkim, Darjeeling, alt. 7,000 ft. (*Miss Wetherall*: vi, 1924).

One specimen. A small, fragile form related to *A. 7-notatus* Pic.* The antero-lateral fossae of the prothorax are very deep, as in *Stenothemus (Podabrus) refossicollis*, which (if correctly identified by me) has simple tarsal claws.

Anolis abdominalis Pic.

? *Podabrus (Anolis) abdominalis* Pic, L'Echange, xxii, p. 81 (1906).

Hab. 'INDES.'

A small narrow black *Anolis* (♀), length about 7 mm., captured by Major Hingston at Singhik, Sikkim, differs from Pic's diagnosis in having a wholly black abdomen, a character of very little importance in this genus. A variety (♀) of the same species, occurring at the same locality and in the Rungbong Valley, Sikkim, has a transverse space before the eyes, and the prothorax rufescent; this may be referable to *Podabrus ruficollis* Pic (1921), from 'Indes Or.,' diagnosed in seven words. These Sikkim specimens have both the tarsal claws toothed at about the middle, the second antennal joint more than half the length of the third, and the head and prothorax alutaceous.

Anolis ocularis, n. sp.

♂. Narrow, finely pilose, shining, the head and prothorax sub-opaque; nigro-piceous or black, the bases of mandibles, palpi in part, prothorax, terminal segments of abdomen, and legs testaceous, the tarsi slightly infuscate; head and prothorax alutaceous, the elytra rugulose. Head obliquely narrowed into a short flattened neck behind the very large prominent eyes, and (with them) as wide as elytra; antennae filiform, rather stout, nearly reaching apex of elytra, joint 2 short, 3-11 elongate. Prothorax narrow, about as long as broad, narrowing from base, sinuate at sides, hollowed laterally towards apex and

* = *Cantharis multimaculata* Pic, *Mélanges exot.-entom.*, xvii, p. 9 (1916).

also down the middle behind. Elytra moderately elongate, sub-parallel. Tarsal claws sharply toothed at about middle. Terminal (covered) ventral segment with long inwardly-directed, and the corresponding dorsal segment with long outwardly-directed, lateral lobes; median lobe truncate at tip.

♀. Eyes smaller; antennae equally elongate, but more slender, joint 2 longer, more than half the length of 3; anterior portion of head and base of antennae testaceous, the elytra dilute fuscous; sixth ventral segment bi-impressed, appearing carinate down the middle.

Length $5\frac{1}{2}$ –6 mm.

Hab. SIKKIM, Singhik and Tsuntang, alt. 3,500–7,000 ft. (*Major Hingston*: iv, 1924).

Ten ♂♂, one ♀, captured by the 1924 'Everest Expedition.' Differs from *A. abdominalis* Pic (1906), type from 'Indes,' by the testaceous prothorax and legs, and also, presumably, by the very large eyes in ♂, a character shared by *A. eburneus* Bourg. (1902), from Darjeeling, an insect with a maculate prothorax and yellowish-white elytra, the infusate suture excepted.

Anolis fumidus n. sp.

♀. Less elongate than *Podabrus fuscolineatus* and *P. annulicornis* (supra), finely pubescent, shining; piceous or nigro-piceous, the head opaque, almost black, the basal margin and sides of the prothorax to a variable extent, and the outer margin of the elytra, testaceous, the antennae, femora, and bases of the tibiae flavo-annulate, the mandibles and palpi in part testaceous. Head rather short, moderately narrowed behind the eyes, the latter not very large; antennae slender, filiform, about reaching the middle of the elytra. Prothorax transverse or not longer than broad. Elytra shining, moderately elongate, widened towards the apex, roughly punctured. Tarsal claws all sharply toothed near the middle.

Length 6–7½ mm.

Hab. N. KUMAON, Sunderdhunga, Pindar Valley, and Gori River Gorge, N. Kumaon, alt. 8,000–12,000 ft. (*H.G.C.*); TIBET, Tropde, alt. 11,000 ft. (*Major Hingston*).

Eight ♀♀. This insect would perhaps be as well placed under *Rhagonycha*. The head is comparatively short, as in *A. lapponicus* Gyll. The shining, shorter prothorax and annulate antennae separate *A. fumidus* from *A. abdominalis* Pic.

Anolis rubicundus, n. sp.

♂. Elongate, very narrow, slender, parallel-sided, closely, finely pubescent; rufous or rufo-testaceous, the head in great part (except at the sides behind the eyes), antennae, the prothorax with a narrow median vitta and a patch at sides, the scutellum, legs in part, and under-surface, infusate or black, the mandibles and a space behind them testaceous; densely, very finely, the elytra rugulose punctured, the latter bicostate on disc. Head broader than prothorax, elongated and obliquely narrowed behind the eyes, transversely depressed posteriorly, the eyes prominent, small; antennae filiform, extremely elongate, joint 2 very short. Prothorax narrow, longer than broad, sub-cylindrical, deeply sulcate down middle and broadly hollowed towards sides anteriorly,

emarginate in centre at base. Elytra very elongate, much broader than prothorax. Tarsal claws each sharply toothed near base.

♀. Broader, the prothorax not longer than broad, head less narrowed posteriorly.

Length 5-8 mm.

Hab. UPPER BURMA, Ruby Mines, alt. 5,000-7,000 ft. (*Doherty*). One pair, the ♀ imperfect and very much larger than ♂. A small, narrow form, the red coloration of the upper surface giving it the general facies of a Lycid.

STENOTHEMUS Bourgeois.*

Stenothemus refossicollis Pic.

? *Podabrus refossicollis* Pic, L'Échange, xxiii, p. 175 (1907).

Hab. N. INDIA, Kurseong (*type of Pic*); TIBET, Rongshar Valley, alt. 9,500 ft. (*Major Hingston*).

A specimen (♀) from the Rongshar Valley agrees with Pic's diagnosis, except that it has the prothorax somewhat sinuate at the sides. The tarsal claws are simple, and the hind angles of the prothorax are prominent, as in *Stenothemus*. The Y-shaped blackish mark behind each of the antero-lateral prothoracic fossae is sharply defined, the elytra are fusco-marmorate (except on the shoulders) and the femora and tibiae mottled with fuscous.

THEMUS Motschulsky.

Themus Motschulsky, Etud. Ent. vi, p. 27 (1857), ix, p. 10 (1860); Bourgeois, Compt.-Rend. Soc. Ent. Belg., xxxv. p. cxxxix (1891), Bull. Mus. Paris, viii, p. 427 (1902); and G. Lewis, Ann. and Mag. Nat. Hist. (6) xvi, p. 109 (1895).

This genus, type the Japanese *T. cyanipennis* Motsch., is accepted by Bourgeois, Pic and Lewis, but is ignored by Gorham, though many of his conspicuous Eastern *Telephori* belong to it. Its chief characters are the simple tarsal claws in the two sexes, and the more or less elongated second antennal joint, but this latter structure fails in two species here treated as congeneric. The prothorax has the lateral margins broadly expanded and reflexed, except in *T. nepalensis* Hope (a close ally of *T. crassimargo*) and some others. *Themus* includes numerous conspicuous Eastern forms, and about twenty Himalayan species are represented in the material under examination; but *T. metallescens* and *T. subaenescens* Bourg. (1909), if I have correctly identified them in the collections made by G. Lewis in Ceylon, have one of the tarsal claws of each foot cleft in ♂, as in the Indian *Telephorus*

* Three species of this genus were enumerated in my last paper, E. M. M., 1925, pp. 265, 266.

semiustus and *T. stygianus* Gorh., and these four insects would therefore be better placed under *Discodon*. Many of the large Indian, Japanese and Chinese *Themus* have metallic (shining or opaque) elytra, others (*T. cacharensis* and *hobsoni*) are in great part testaceous, others again (*T. fuliginosus* and *inequalithorax*) are uniformly fuliginous or piceous.

Themus nepalensis Hope.

Telephorus nepalensis Hope, in Gray's Zool. Misc. 1831, p. 26; Gorh. P.Z.S. 1889, p. 97.

'Cyaneus, capite rufo, elytrisque cyaneis, femoribus rufis, tibiis tarsisque nigro-caeruleis. Long. lin. 8; lat. 2 $\frac{1}{4}$.'

♂. Terminal (covered) ventral segment with long narrow lateral lobes, the apical portion of which is abruptly thickened and hooked at tip beneath, the corresponding dorsal segment with shorter, broad, spoon-shaped lobes.

Hab. Nepal (*Hardwicke*: type), Mungphu, Manipur, Assam, Nagas (*Mus. Brit.*).

The numerous specimens of this insect before me, including the types, are in bad condition. They all have the tibiæ, tarsi, and joints 9-11 of the antennae black. The prothorax is subtrapezoidal, more narrowed anteriorly than in the allied forms, and rufous in colour, like the head.

Themus chalybeipennis Gorham.

Telephorus chalybeipennis Gorh. P.Z.S. 1889, p. 96, pl. 10, fig. 2.

♂. Terminal (covered) ventral segment with long lateral lobes, the apical portion of which is anchor-shaped (angularly dilated below and hooked at tip above), vertical, and twisted, the corresponding dorsal segment with spoon-shaped shorter ciliate lobes.

♀. Seventh ventral segment narrowly emarginate at tip.

Hab. N. INDIA (*Capt. Boys, in Mus. Oxon*), Kulu, Punjab, Simla (*Mus. Brit.*), Ranikhet and W. Almora, Kumaon (*H.G.C.*), Assam.

Separable from *T. nepalensis* Hope by its smaller size, subparallel elytra, and testaceous tibiæ, and the anchor-shaped lateral lobes of the seventh ventral segment of the male. Both species have soft, very shining, metallic violaceous or green elytra, which are hollowed on the disc below the base and transversely so towards the apex, and also at the sides before the middle, and coarsely rugosely punctured below the humeri.

Allied forms occur in China (*T. coelestis* Gorh.) and Formosa.

Themus crassimargo, n. sp.

♂. Robust, broad, very shining, glabrous above, pubescent beneath; testaceous, the elytra violaceous or nigro-violaceous, the apical two or three joints

of antennae, the tibiae on their outer edge, and the tarsi, black or piceous; the head and prothorax almost smooth, the elytra very sparsely punctured, rugosely so in the dorsal cavity posteriorly. Head broad, the eyes rather small; antennae long, sub-filiform, rather stout, tapering towards tip, joints 2 and 3 sub-equal in length. Prothorax nearly as wide as base of elytra, much broader than long, transversely sub-quadrate, slightly narrowed anteriorly, the margins greatly raised. Elytra soft, moderately long, arcuately dilated from a little below the base to the apex, strongly, obliquely compressed below the prominent swollen humeri, and with a large, common, sub-quadrate dorsal cavity, followed by a more or less distinct transverse plica; the rounded lateral margins thickened and very conspicuous. Legs stout. Terminal (covered) ventral segment with moderately long, slightly sinuate, lateral lobes, which are rounded at tip, the lobes of the corresponding dorsal segment short and broad.

♀. Antennae a little shorter.

Length 10-14 mm, breadth $5\frac{1}{2}$ -7 mm.

Hab. N. INDIA (*Mus. Brit.*), Gopaldhara, Sikkim (*H. Stevens*, vii, 1924, viii, 1918: ♂ ♀ : types), Manipur (*ex coll. Fry* : ♀).

Three ♂♂, two ♀♀, including a pair taken 'at light' and mounted on the same pin by Mr. Stevens. Less elongate than *T. nepalensis*, the elytra arcuately dilated laterally and with prominent thickened margins, the rugosely punctured post-humeral space transferred to the apical half of the common dorsal cavity, the margins of prothorax greatly raised.

Themus ancoralis, n. sp.

♂ Smaller and less robust than *T. nepalensis* Hope, and similarly coloured, except that the anterior and intermediate tibiae are wholly or in part, and the posterior tibiae constantly, testaceous (as in *T. chalybeipennis* Gorh.); the elytra arcuately dilated beyond the middle, and similarly excavate on the disc, towards the apex, and below the shoulders, the post-humeral region coarsely, rugosely punctured. Testaceous, the apical three, four or five joints of antennae, tarsi, and anterior and intermediate tibiae in some specimens in part, black, the elytra soft, very shining, varying in colour from violaceous to brassy-cupreous. Head broad, very sparsely punctured; eyes rather small; antennae long, comparatively stout, tapering towards tip, joint 3 longer than 2 and shorter than 4. Prothorax smooth, transversely quadrate. Elytra moderately dilated beyond middle, sparsely punctured and pubescent, narrowly margined, the humeral region rugose. Terminal (covered) ventral segment with the long lateral lobes dilated and anchor-shaped at tip, the upper branch curved, the lower one angulate (much as in *T. chalybeipennis* Gorh.).

♀. Antennae more slender, filiform.

Length 11-15½ mm., breadth 4½-8 mm.

Hab. N. INDIA (*Mus. Brit.* : types : ♂ ♀), Rungbong Valley, Gopaldhara, Sikkim (*H. Stevens* : ♂ ♀), Mungphu (*ex coll. Atkinson* : ♂), Katmandu, Nepal (*Col. M. Smith* : ♀).

Nine specimens, five of which were captured by Mr. Stevens. If we take the form of the non-exposed terminal abdominal segments of the male as diagnostic, *T. ancoralis* should be treated as a variety of *T. chalybeipennis* Gorh.; but as the latter has not been

found in the same localities, and the elytra are arcuately dilated as in *T. nepalensis* and *T. crassimargo*, it is advisable to give this insect specific rank.

Themus versicolor Gorham.

Telephorus versicolor Gorh. P.Z.S. 1889, p. 97.

♂. Terminal (covered) ventral segment with the lateral lobes short, broad, produced into a narrow, curved, blunt hook at the tip, the corresponding dorsal segment almost entire, the median lobe (as seen everted) deeply cleft.

Hab. INDIA (*ex coll. Fry*), Khasia Hills (*type of Gorham*), Bootan (*Capt. Pemberton*).

There are two specimens (♂ ♀) of this species in the National Collection. A large, elongate, shining insect, luteous or flavous in colour, with rather more than the basal half of the elytra brilliant caeruleo-violaceous, and the tarsal joints 1-4 infusate; the elytra coarsely, closely punctured, and almost smooth at the base and apex; the prothorax broad, transversely subquadrate, with raised margins; the tarsal claws simple.

Themus sikkimensis Pic.

Cantharis sikkimensis Pic, Bull. Soc. Autun, xxiv, p. 109 (1911).

? Var. ♀. *Cantharis semistrangulata* Pic, Mélanges exot.-entom. xxiv, p. 4 (1917).

♂. Antennae long, slender, filiform, joint 1 stout; anterior tibiae bowed inward in their apical third; terminal (covered) ventral segment with the lateral lobes very broad, deeply concave, and obliquely truncate and ciliate at apex, the corresponding dorsal segment entire; median lobe with a long horn-like process projecting on each side beneath (as seen from ventral aspect).

♀. Antennae shorter, joint 1 not so stout; elytra strongly constricted posteriorly.

Var. ♀. Apices of the femora. the tarsi entirely, and two oblong spots on the disc of prothorax, black. [Shillong.]

Hab. INDIA, Sikkim (*type of Pic*), Gopaldhara (*Stevens*), Kurseong, Allahabad, Mungphu, (*Mus. Brit.*), Almora, Kumaon (*H.G.C.*), Khasia Hills (*Mus. Oxon*), Shillong (*F.W.C.*, var.); TIBET, Pakyong, alt. 5,000 ft. (*Major Hingston*: vi, 1924).

A common insect in Sikkim and one of the finest of the Indian Telephorids. It has the head nigro-violaceous, the tarsi and outer part of the tibiae black; the elytra violaceous or green, granulate, subopaque, and much narrowed posteriorly; and the antennae (except towards apex), prothorax, under surface, and the rest of the legs testaceous. The prothorax is smooth, very broad, transversely subquadrate, and much raised at the sides. The antennae in both sexes have joints 2 and 4 subequal in length, each much

longer than 3. The tarsal claws are simple in both sexes. Two males have been dissected, the armature of the terminal segments being very peculiar. Females largely preponderate in the long series examined. The length varies from 15-20 mm. A well-marked variety of this sex was captured by my second son (F.W.C.) at Shillong, Assam. *C. semistrangulata* Pic, from 'Indes,' type certainly ♀, seems to belong to the same species.

Themus venningi, n. sp.

♂. Very elongate, broad, shining, the elytra opaque, pubescent; testaceous, the base of head (except behind eyes) nigro-violaceous, the prothorax with two oblong, approximate, metallic streaks on disc, the elytra bluish-violaceous, the femora at apex, tibiae, and tarsi nigro-piceous, the antennae infusate towards tip; head and prothorax very sparsely, finely punctured, the elytra closely granulate. Head much narrower than prothorax, hollowed between the eyes, which are rather small and prominent; antennae filiform, very elongate, joint 1 stout, 2 and 4 equal in length, 3 much shorter. Prothorax as broad as base of elytra, strongly, transversely sub-quadrate, rounded at sides, and deeply excavate within. Elytra elongate, much narrowed posteriorly. Legs very long; anterior tibiae bowed inwards towards apex; anterior tarsal joint 1 elongate. Terminal (covered) segment with broad, concave lateral lobes, which are curved upward and inward at tip, and hooked at inner apical angle; median lobe very broad, truncate at apex, and hooked at each outer angle inferiorly, the shorter upper portion notched (as seen from ventral aspect); terminal dorsal segment divided at apex into two broad, curved, divergent lobes.

♀. Antennae much shorter and more slender, joint 1 not so stout; prothorax not so wide as elytra, the oblong dorsal streaks broader and angulate externally. Length 17-20 mm., breadth $4\frac{1}{2}$ -5 $\frac{1}{2}$ mm.

Hab. UPPER BURMA, Haka, Chin Hills (F. E. Venning: 1, viii, 1910: type, ♂); N.E. INDIA, Manipur (Doherty: ♀).

Two specimens. A close ally of *T. sikkimensis* Pic, and with similarly bowed anterior tibiae in ♂, the head testaceous in front, the prothorax narrowly bivittate on disc, the terminal abdominal segments of ♂ very different in structure. In the partly testaceous head *T. venningi* approaches *Cantharis semistrangulata* Pic.

Themus khasianus Gorham.

Telephorus khasianus Gorh. P.Z.S. 1889, p. 97, pl. 10, fig. 1 (♂).

Themus khasianus Bourg. Compt.-Rend. Soc. Ent. Belg. xxxv, p. cxxxix (1891).

Cantharis lineatofemoralis Pic, Mélanges exot.-entom. xxiv, p. 4 (1917).

♂. Antennae extremely elongate, filiform; terminal (covered) ventral segment with short broad lateral lobes, which are widened distally and hollowed at apex, the corresponding dorsal segment hollowed at tip, and with an acute triangular projection on each side opposite the dilated portion of the ventral lobes, the two forming a clasping-organ.

♀. Antennae shorter and more slender.

Var. ♀. Head entirely, the prothorax with a broad transverse patch or two spots on disc, and metasternum nigro-violaceous, the legs and antennae nigropiceous. [Ruby Mines.]

Hab. INDIA, Gopaldhara (*H. Stevens*), Kurseong, Gantok, Mungphu, Sikkim, Jantia Hills, Khasia Hills, Shillong, Assam (*Mus. Brit.*), Almora, Kumaon (*H.G.C.*), Bengal (*type of Pic*); UPPER BURMA, Ruby Mines, (*Doherty*).

A widely distributed variable insect, ranging from Kumaon to Burma, distinguishable by the metallic, closely punctured, more or less sulcate basal portion of the head; the transversely-subquadrate, testaceous prothorax, with a broad metallic dorsal patch (interrupted in two ♀♀ only, from Burma, in the long series examined); the opaque, granulate, posteriorly-narrowed, metallic (green, blue, or brassy) elytra, which in some of the typical Assam specimens is testaceous along the apical margin; and the testaceous under surface, the ventral segments usually with a black or dark spot on each side (not noticed by Gorham). The legs and antennae vary in colour, the former often in part metallic. The third antennal joint is much longer than the second and shorter than the fourth in both sexes. The terminal segments of four males have been examined. The four females received from the Ruby Mines vary in colour, two of them belonging to the form described above. Bourgeois has noted other varieties of this species from Kurseong.

Themus subviridipennis Pic.

Themus subviridipennis Pic, *Mélanges exot.-entom.* xviii, p. 13 (1916).

'Elongatus, subparallelus, nitidus, proparte testaceus aut rufus, pro parte nigro-viridescens, thorace pallido, viridi-bimaculato, elytris testaceis, vage metallicis. Long. 17-18 mill.'

Var. Head with the testaceous frontal portion extending down the middle to base; prothorax with two oblong or small rounded dark spots on disc (♂♂) or entirely testaceous (♀♀); elytra darker, bluish-green at base or entirely brassy-green.

♂. Antennae very elongate, filiform, joint 2 much longer than 3; eyes large and prominent; terminal (covered) ventral segment with long, concave lateral lobes, which are blunt at tip, the lobes of the corresponding dorsal segment short, spoon-shaped.

♀. Antennae much shorter; eyes smaller.

Hab. N.W. INDIA, Kakkar [Cachar] (*Mus. Brit.* : vars., ♂♀), Sikkim (*type of Pic*), Simla (*E. C. Ansorge*), W. Almora, Kumaon (*H.G.C.* : ♂♀).

Seven specimens before me are referred to this species, which is separable from *T. khásianus* by its smoother head, larger eyes, narrower prothorax, with a narrowly-divided metallic patch on disc, subparallel, aeneo-testaceous, granulate elytra, etc. The varietal forms, which have similar ♂ characters, have a differently coloured head and prothorax. Three males have been dissected for comparison.

Themus stevensi, n. sp.

♂. Very elongate, narrow, parallel-sided, shining, pubescent; testaceous, the head nigro-violaceous, the mandibles, palpi, and antennae piceous, the elytra brassy-green; head and prothorax very sparsely, finely, the elytra densely, rugosely punctured. Head about as wide as prothorax, almost unimpressed between the eyes, which are large and prominent; antennae filiform, long, slender, joints 2 and 3 sub-equal in length, 4 and following joints elongate. Prothorax sub-quadrate, very little broader than long, slightly hollowed at the sides towards the base, transversely grooved anteriorly. Elytra extremely elongate, much wider than prothorax, sub-parallel. Terminal (covered) ventral segment with long, gradually-narrowed lateral lobes, which are blunt at tip, the corresponding dorsal portion of the segment entire; median lobe sulcate, appearing bifid at apex.

♀. Eyes less prominent, prothorax broader and more transverse.

Length 17-19 mm., breadth $3\frac{1}{2}$ -4 mm.

Hab. Sikkim, Rungbong Valley, Gopaldhara, alt. 4,720 ft. (*H. Stevens*: 2, x, 1914).

Two specimens, the ♂ captured 'at light.' Much narrower than *T. subviridipennis* Pic, the legs and prothorax entirely testaceous, joints 2 and 3 of the antennae sub-equal in length, the lobes of the seventh ventral segment of ♂ longer.

Themus cacharensis, n. sp.

♂. Very elongate, narrow, opaque, the head and prothorax shining, the head clothed with long whitish hairs, the elytra closely pubescent; flavo-testaceous, the head between and behind the eyes (except down the middle), the prothoracic callosities, scutellum, an oblong humeral patch extending narrowly down each elytron, the metasternum in part, a spot at the sides of each ventral segment, and the legs in great part, fusco-violaceous or piceous, the antennae (except joints 1 and 2) also infusate; head transversely rugose between the eyes, smoother in front and behind, the prothorax almost smooth, the elytra closely granulate. Head (with the large prominent eyes) a little wider than prothorax, transversely hollowed towards base; antennae long, slender, filiform, tapering, joints 1 and 2 equal in length, together slightly longer than 3. Prothorax sub-quadrate, a little broader than long, deeply excavate on each side anteriorly and also before the base, quadrinodose on disc, the anterior nodes obliquely curved, the lateral margins raised and sinuate. Elytra very elongate, much wider than prothorax, narrowed posteriorly. Tarsal claws long, simple. Terminal (covered) ventral segment with long lateral lobes, which become very slender towards apex, the corresponding dorsal segment emarginate at apex.

Length 18 mm.

Hab. N. Cachar Hills, E. Assam (*Godwin-Austen*).

One ♂. Near *T. stevensi* from Sikkim. *Cantharis* (*Telephorus*) *maxima* Pic, from Kulu, appears to have a shorter prothorax, the head and elytra testaceous, the tibiae only black, etc.

[*Themus bieti* Gorham.

Telephorus bieti Gorh. P.Z.S. 1889, p. 101, pl. 10, fig. 5.

♂. Antennae rather stout, moderately long, joint 2 shorter than 3; terminal (covered) ventral segment with long, gradually narrowed, lateral lobes, which are somewhat pointed at tip, the dorsal lobes short, spoon-shaped, the median lobe cleft (as seen from behind).

♀. Antennae shorter and more slender, joint 2 as long as 3.

Hab. CHINA, Tatsienlou, Se Chuen (*ex coll. Fry*).

There are two specimens of this species in the British Museum. It has a nigro-violaceous, sulcate head; a transversely-subquadrate, almost smooth, testaceous prothorax, with a broad metallic patch on the disc; cupreous, opaque, granulate elytra; and the limbs and under surface nigro-piceous or black. The allied Tibetan *T. (Cantharis) pallidocincticollis* Pic (1917) has longer differently-coloured elytra, the abdomen partly testaceous, etc. *Telephorus thibetanus* Gorh. (l.c. p. 102, from the same locality), both sexes of which are before me, has the tarsal claws formed as in that genus. *T. bieti* must be treated as congeneric with the Japanese *T. cyanipennis* Motsch., the type of the genus *Themus*; Gorham gave the locality as in 'Tibet,' following the printed labels on the insects.]

Themus (?) *chrysocephalus*, n. sp.

♂. Rather broad, moderately elongate, cinereo-pubescent, shining, the elytra dull; head, scutellum, and elytra metallic green or greenish, mandibles and palpi in part, prothorax (two metallic spots on disc excepted), femora to near the tip, coxae, and in the Tibetan specimen the tibiae also, testaceous, the antennae (the testaceous basal joints excepted), apices of femora, tibiae (in Sikkim example), tarsi, and abdomen black or metallic. Head sparsely punctured, sulcate towards base, and transversely hollowed between the bases of the antennae, the eyes rather small; antennae filiform, rather stout, about reaching the middle of the elytra, joint 2 shorter than 3, 3 shorter than 4. Prothorax transversely sub-quadrate, much wider than head, almost smooth, the margins raised. Elytra broader than prothorax, much narrowed posteriorly, coriaceous, sub-granulate, without raised lines. Legs rather stout; tarsal claws simple. Terminal (covered) ventral segment with long, straight, narrow, concave lateral lobes, between which and the stout median lobe an acutely-pointed process is visible, the corresponding dorsal segment emarginate.

Length 9-10 mm.

Hab. Sikkim, Rungbong Valley, Gopaldhara (*H. Stevens*: vi, 1920: type); TIBET, Chumbi Valley, alt. 10,000 ft. (*Major Hingston*: II, vii, 1924).

Two males, the tibiae black in one example and testaceous in the other. Smaller than *T. tumlongana* Pic (1916), length 13 mm., from Tumlong, India, the head metallic, the apices of the femora black, the antennae stouter. *T. bieti* Gorh. is also a much larger allied insect. If the relative length of the second antennal joint is regarded as a character of generic importance, *T. chrysocephalus* may have to be removed from *Themus* when the two sexes are known.

Themus fuliginosus Bourgeois.

Themus fuliginosus Bourg. Compt.-Rend. Soc. Ent. Belg. xxxv, p. cxxxix (1891).

♂. Terminal (covered) ventral segment with feebly curved, simple, spoon-shaped lateral lobes, the corresponding dorsal segment entire, hollowed at apex.

Hab. N. INDIA, Kunbir Nowatoli, Kurseong (*type*, ♂, of *Bourgeois*); TIBET, Yatong, alt. 10,500 ft. (*A. E. Hobson*), Rongshar Valley, alt. 11,000 ft. (*Major Hingston* : 26, vi, 1924).

Four Tibetan specimens are referred to this species, which is separable from *T. inequalithorax* Pic by its uniform fuliginous-brown colour (the dilute prothoracic margins excepted), the almost smooth, polished interocularly-depressed portion of the head, the broadly margined, binodose, much smoother prothorax, the more rugose elytra, and the simple lateral and median lobes of the terminal ♂ ventral segment. The colour of the abdomen is variable—sometimes wholly testaceous (a black spot on the sides of each segment excepted), sometimes infusate with the margins only pale. The antennae are very long and slender, shorter in ♀, with joint 2 much longer than 3, 4-10 obsoletely sulcate in ♂.

Themus puncticeps, n. sp.

♂. Extremely like, and perhaps a form of, *T. fuliginosus* Bourg., and similarly coloured, the femora paler at the base; the head less depressed between the eyes, densely, finely punctured and longitudinally sub-carinate at the base; the antennae not quite so elongate, joint 2 much longer than 3, 3-11 somewhat flattened; the lateral lobes of the last (covered) ventral segment narrow, long, simple, concave, slightly hooked at tip.

♀. Larger and with broader head and prothorax.

Length 17-22 mm.

Hab. TIBET, Tropde, alt. 11,000 ft. (*Major Hingston*, 24, vi, 1924 : *type*, ♂); Yatong, alt. 10,500 ft. (*A. E. Hobson* : ♀).

The *type*, ♂, of this insect has the basal portion of the head as densely punctured as in *T. inequalithorax* Pic, thus differing from the species here identified as *T. fuliginosus* Bourgeois, who unfortunately does not describe the cephalic sculpture. The single female from Yatong differs in the same way from the other speci-

mens (♂ ♀) before me from the same locality, and presumably belongs to the present species.

Themus inequalithorax Pic.

Cantharis (*Themus*) *inequalithorax* Pic, *Mélanges exot.-entom.* xvii, p. 9 (February, 1916).

♂. Terminal (covered) ventral segment with broad, curved, spoon-shaped lateral lobes, which are obliquely truncate and slightly hollowed at apex, the corresponding dorsal segment narrowly cleft and divided into two simple spoon-shaped lobes, the median lobe truncate at tip, broad.

Hab. INDIA (*type of Pic*), Gantok, Sikkim, alt. 5,000 ft. (*Major Hingston* : 28, iv, 1924 : ♂), Mungphu (*ex coll. Atkinson* : ♀); TIBET, Rongshar Valley, alt. 9,500 ft. (*Major Hingston* : 24, vi, 1924 : ♀)). .

An extremely large, elongate form, nigro-piceous in colour, with the antennae, a spot between the eyes, scutellum, the legs in part, and under surface (except the abdomen in part of some specimens) testaceous; the head and prothorax densely, finely, the elytra rugosely, punctured, the prothorax bi- or quadrinodose on the disc, the elytra finely costate. Head rather small, the eyes prominent; antennae moderately long, slender, filiform, joint 2 much longer than 3 and nearly as long as 4, the outer joints elongate in ♂; prothorax strongly transverse, much narrower than elytra, subquadrate, obliquely narrowed behind each hind angle; elytra subparallel, very elongate. Five specimens seen, and one of each sex dissected. The Tibetan ♀ is darker than the rest. The length varies from 18-22 mm.

Themus praelongus, n. sp.

♂. Extremely elongate, finely pubescent, dull; rufo-testaceous, the head with a broad space on each side between and behind the eyes and the elytra black, the antennae (joints 1 and 2 excepted) infusate; the head and prothorax closely punctured, the basal half of the former rugose and narrowly sulcate, the elytra rugose and ~~ob~~oleately costate. Head about as wide as prothorax, the eyes large and prominent; antennae very elongate, extending to beyond middle of elytra, rather stout, filiform, joint 2 much shorter than 1, 2 and 3 sub-equal in length and together longer than 4, 4-11 elongate. Prothorax transversely quadrate, much broader than long, obliquely narrowed at the hind angles, transversely grooved anteriorly, sulcate down middle, and hollowed along the sides, the lateral margins appearing much raised and slightly sinuate, the anterior angles prominent. Elytra extremely elongate, parallel, one-half wider than prothorax. Tarsal claws simple. Terminal (covered) ventral segment with long, almost straight lateral lobes; median lobe narrowed towards apex, a stout lobe projecting on each side of it beneath; terminal dorsal segment broadly bilobed.

Length 20 mm.

Hab. N. Kumaon, Pindar Valley and Gori River Gorge, alt. 8,000-11,000 ft. (*H.G.C.* : vii 1920, and later).

Two males, precisely similar, except that the head is more broadly red down the middle posteriorly in one of them. Near *Themus reymondi* Bourg. (1907), type from Tseram, Nepal, alt. 13,400 ft., based upon a single specimen, ♂; but not quite agreeing with the description of that insect, which is said to have the prothorax scarcely broader than long, the margins narrowly raised, and the hind angles rounded, the antennae slender, with joint 2 very little shorter than 1, etc. The allied *T. longipennis* Fairm. (1891), from Kashmir, has the angles of the prothorax rounded; *T. coriaceus* Fairm. (length 14 mm.) comes near to *T. pindarae*.

Themus hobsoni, n. sp.

♂. Extremely elongate, finely pubescent, sub-opaque, the elytra slightly shining; rufo-testaceous, the elytra and legs testaceous, the antennae (joint 1 excepted) black; head and prothorax densely, very finely, the elytra rugosely, punctured, the latter obsoletely costate. Head about as wide as prothorax, sulcate down the middle posteriorly, the eyes large and prominent [antennae broken]. Prothorax transversely quadrate, obliquely narrowed at hind angles, uneven, transversely hollowed anteriorly, feebly sulcate down the middle, and excavate along the sides, the lateral margins feebly sinuate. Elytra very elongate, sub-parallel, about one-half wider than prothorax. Tarsal claws simple. Terminal (covered) ventral segment with long narrow lobes, which become more slender, sinuate, and upturned at tip, the corresponding dorsal segment emarginate in centre at apex; median lobe narrowed distally, a stout, downwardly-curved lobe projecting on each side of it beneath.

♀. Elytral margins black to beyond middle; eyes a little less prominent; antennae (fig. b) slender, filiform, about reaching middle of elytra, joints 2 and 3 equal in length, together longer than those following, the latter very elongate, 10 and 11 short, together shorter than 9, 10 curved and compressed.

Length 20 mm.

Hab. TIBET, Yatong, alt. 10,500 ft. (*A. E. Hobson*: ♂, type), Rongshar Valley, alt. 12,000 ft. (*Major Hingston*: 30, vi, 1924: ♀).

One pair—the ♂ imperfect, the ♀ with peculiarly-formed apical joints to the antennae. Near *T. maxima* Pic (1907), from Kulu, Himalaya, an insect with the antennae (joints 1 and 2 excepted) and tibiae black, the prothorax maculate, etc. The black marginal line of the elytra is wanting in the ♂ of *T. hobsoni*.

Themus pindarae, n. sp.

♂. Elongate, finely pubescent, shining, the elytra dull; testaceous, the head with a broad space on each side behind the eyes, the prothorax with two narrowly-separated oblique patches on disc, the antennae (joints 1 and 2 excepted), the elytra, metasternum, posterior coxae, and a spot at the sides of each ventral segment, black; head and prothorax (the almost smooth callosities on disc excepted) finely, the elytra rugosely punctured, the last-named also faintly costate. Head rather small, barely as wide as prothorax, the eyes not very large; antennae very long, reaching to beyond middle of elytra, filiform, joints 2 and 3 sub-equal in length, together a little longer than 4, 5 in one example feebly angulate on outer edge beyond middle. Prothorax much broader

than long, transversely quadrate, obliquely narrowed at hind angles, transversely grooved anteriorly, sulcate down the middle, and hollowed along the sides, the lateral margins appearing much raised, the anterior angles rounded. Elytra much wider than prothorax, very elongate, sub-parallel. Tarsal claws simple. Terminal (covered) ventral segment with long, slender, porrect, lateral lobes, the median lobe accompanied by an equally long, downwardly-curved hook-like lobe on each side inferiorly; terminal dorsal segment emarginate at apex.

♀. Head smaller, eyes less prominent; antennae much shorter, joints 2 and 3 united much longer than 4; elytra broader and less elongate.

Length 15-17½ mm.

Hab. N. Kumaon, Sunderdhunga and Pindar Valley, alt. 8,000-12,000 ft. (*H.G.C.* : vi, 1919, vii, 1920).

Eight examples, four of each sex. Smaller than *T. praelongus* from the same region, the eyes much smaller, the head less rugose, the prothorax bimaculate on disc and with the anterior angles rounded, the elytra less elongate, the ♂ with the lobes beneath the median one hooked at tip. A closely allied unnamed form in the British Museum represented by a single imperfect ♂, captured by Mr. F. J. Mitchell in Kashmir, in 1923, has the eyes more prominent, the prothorax more dilated anteriorly, and with the black spots on the disc subarcuate, the elytra more rugose, etc.; this insect may be a small *C. (Telephorus) kaschmirensis* Pic (1909).*

Themus (?) *comans*, n. sp.

♀. Elongate, rather broad, dull, thickly clothed with long, pallid pubescence; obscure testaceous, the antennae (joints 1 and 2 excepted), disc of prothorax (except down middle), elytra (epipleural margin excepted), tibiae, and abdomen in part, nigro-piceous or black; the head and prothorax closely, finely punctured, the elytra rugosely granulate and sub-costate. Head (including the large prominent eyes) nearly as wide as prothorax, uneven; antennae filiform, barely reaching the middle of elytra, joint 2 much shorter than 3. Prothorax strongly transverse, rounded and slightly sinuate at the sides, broadly binodose on disc posteriorly, transversely grooved anteriorly, sulcate down the middle, and hollowed within the raised margins, the hind angles obtuse. Elytra long, much broader than prothorax, somewhat dehiscent at suture and rapidly narrowed from near base. Tarsal claws simple.

Length 16 mm.

Hab. Ranikhet, Kumaon. (*H.G.C.*).

A single specimen. A dull, obscurely-coloured, thickly pubescent insect related to *T. pindarae*, with larger eyes, a broader head, a shorter second joint to the antennae, a rugulose prothorax, which is without definite hind angles, and rugosely granulate elytra. The simple tarsal claws (in ♀) separates *T. comans* from *Athemus*, *Ancistronycha*, *Telephorus*, etc. The third antennal joint is relatively shorter than in the typical species of *Themus*.

* Nec *C. kaschmirensis* Pic (1916).

ON THE FORMS OF THE VARIOUS SPECIES OF *CARABUS*
OCCURRING IN THE BRITISH ISLANDS.

BY J. STE. CLAIRE DEVILLE.

I have sometimes been asked to compare specimens of *Carabus* captured in Britain with authentically-named examples of any varieties or sub-varieties described from the continent. I must acknowledge that I have generally failed to identify them. Except for the well-marked and stable species (*glabratus*, *nitens*, *granulatus*), it is difficult to assimilate exactly the British representatives of the genus with the respective continental races. The variations may sometimes be parallel, but the general impression (especially as regards *catenulatus* and *violaceus*) is that the British races have acquired a certain degree of individuality. This fact may be explained if it is allowed that :

(a) The migrations of many members of the genus are very recent. For example, there are no fewer than five species (*coriaceus*, *auratus*, *auronitens*, *convexus*, *cancellatus*) which have invaded Northern France (Departments Nord, Pas-de-Calais and Somme) since the Straits of Dover were formed, and three steppe-frequenting species (*auratus*, *convexus*, *cancellatus*) that are even now very rare in the more remote parts of Brittany.

(b) The majority of the species are still in a stage of actual evolution. The tendency to variation reaches its maximum in the mountainous regions of Southern Europe, where each valley and each mountain range sometimes has its peculiar race. This instability is still very perceptible in the plains of temperate Europe, although the conditions of life are there much more uniform. For instance, the forms of *C. catenulatus* inhabiting respectively the forests of Villers-Cotterets (Aisne) and Compiègne (Oise), localities only fifteen miles apart, are easily distinguishable even to an unpractised eye. *C. auratus*, too, varies in shape in different districts to such a degree that an experienced coleopterist could name the locality it inhabited.

During the last twenty years numerous workers have studied the variation of the continental forms. Nevertheless there is still a certain amount of confusion about some of them, and the descriptions do not always seem to have been made exclusively on scientific grounds. Fortunately the study of the British species affords an almost 'new field' which the 'invaders of the temple' have not yet encroached upon, one form only (*violaceus*, var. *solli-*

citans Hartert) having been named during the period mentioned. It would be a really useful work if one of our colleagues would undertake an exhaustive examination of the ten British species of the genus, particularly with regard to the local races and their general distribution, and compare them with the forms inhabiting the neighbouring countries (Netherlands, Belgium, Northern France and, more especially, Scandinavia). The structure of the genitalia, too, should not be overlooked. In case such a study is undertaken by any competent coleopterist, it would give me real pleasure to supply material for comparison and information as to the general dispersal of each species.

N.B.—Since the above lines have been in type I have seen a very interesting paper on this subject by M. P. Born, entitled 'Die Caraben fauna Norwegens' (Norsk. Ent. Tidsskrift, Vol. II, fasc. 2, May, 1926). In this article, which is a veritable model of the study of a local fauna, frequent allusion is made to the British races, which appear to be well known to the author.

Laboratoires Centraux, Mines de la Sarre,

Saarsbrücken (Saargebiet).

May 1926.

Atheta (Plagiathrina) fordhamiana Keys in Northern France.—A few months ago I received from my old comrade and colleague Col. F. Gruardet a specimen of an *Atheta* which he could not name satisfactorily. Since Mr. J. H. Keys was so good as to give me a typical example of his species, I have been able to identify undoubtedly our unknown *Atheta* with *fordhamiana*. The specimen was captured in the little marsh near Sucy-en-Brie (Seine-et-Oise), a well-preserved locality, where many rare beetles are still to be found. It is, I think, the first example taken on the Continent.—J. S. C. DEVILLE, Laboratoires centraux, Mines de la Sarre, Saarbrücken : May 1926.

Conopalpus testaceus Ol. in Berkshire.—A specimen of this beetle was bred out of a piece of a dead oak bough obtained in February 1926 from Bagley Wood, near Oxford. According to Fowler (Col. Brit. Islands, Vol. V, p. 39) there is no previous record from this district. I am indebted to Dr. J. W. Munro for its determination.—M. L. WEBBER, Imperial Forestry Institute, University of Oxford : April 29th, 1926.

[*Conopalpus testaceus* has occurred to me on several occasions at Wytham Park, Berks., and Mr. J. Collins has also taken it at Cothill, Berks., and near Water Eaton, Oxford.—J.J.W.]

Is Cryptophagus umbratus Er. a myrmecophilous species?—There is in Harpenden an old elm tree, tenanted by a small colony of *Acanthomyops (Lasius) fuliginosus* Latr., which I have been in the habit of visiting, at more or less regular intervals, during last year and the present spring. Last season I took

a number of *Cryptophagus umbratus* Er. in the holes at the base of the tree, the holes being those used by the ants as entrances to their nest. This spring *C. umbratus* has again been present, but more commonly than was the case last year. The question arises as to whether the presence of *C. umbratus* in the runs of *A. fuliginosus* is due to a fondness for its association with the ants, in which case it would be permissible to consider it a true myrmecophile, or whether it is due to the presence of the fungus *Cladosporium myrmecophilum* which the ants are known to cultivate. As the beetle is found in this instance among the débris lying on the bottom of the entrance holes, I am inclined to believe it is a true myrmecophile.—B. S. WILLIAMS, 15 Kingcroft Road, Harpenden: April 22nd, 1926.

A second British specimen of Oxypoda humidula Kr.—While collecting at Otford, Kent, with Mr. E. C. Bedwell on March 13th last, I was fortunate enough to take another specimen of *Oxypoda humidula* Kr. This example agrees with the original British specimen in my collection which was named by Dr. Cameron and on which he introduced the species to the British list, *vide* E.M.M. 1925, p. 155. The distance apart of the two localities (Herts. and Kent) seems to indicate that this insect is to be found if sought for in suitable damp spots: quite possibly it exists in British collections mixed with *O. umbrata* Grav., to which species it bears a strong resemblance. *O. humidula* can be readily separated by its longer and proportionately narrower thorax, somewhat coarser sculpture, and longer and coarser pubescence which is of a lighter colour than that of *umbrata*. The two specimens I possess of *O. humidula* are both females. In this species the female has the apical edge of the 7th dorsal segment narrowly and almost angularly produced in the centre, whilst the produced apical portion of the corresponding plate in the female of *O. umbrata* has the apical edge evenly rounded. The spermatheca of *O. humidula* is very different in appearance from that of *O. umbrata*. The shape of this organ in both resembles a capital 'S,' but that of *O. humidula* is larger and not so clongate, the 'tube' having a diameter at least twice that of *O. umbrata*.—B. S. WILLIAMS: May 11th, 1926.

Coleoptera in nests of the marmot.—In a recently-published paper entitled 'Recherche des Insectes commensaux des Marmottes,' by M. P. Marie (Bull. Soc. Ent. France, 1926, pp. 13–16), five species of Coleoptera are mentioned: *Arpedium alpinum* Fauv. (a rare alpine insect, in numbers), *Homalium validum* Kr. (in plenty, a species also found in rabbit holes), *H. excavatum* Steph., *Catops tristis* Panz., and *Cryptophagus* n. sp.? The nests examined were at Argentières, near Chamonix (Haute Savoie). In the mountainous regions in which marmots live, not many species, as compared with the numerous insects found with the mole, could of course be expected. An undescribed *Atheta* (not unlike *A. currax* Kr.), found in abundance at the entrances to marmot nests, at a high altitude in the Himalaya, has recently been sent me by my son.—G. C. CHAMPION, Horsell: May 1926.

A Nematode worm parasitising a Sawfly larva.—On September 4th, 1924, I swept a sawfly larva from moist grass on a bank by a stream at Puttenham, Hertfordshire. The larva was almost certainly that of *Selandria serva* F., since it agreed very closely with the description given by Miss Chawner (Ent. Mo. Mag., lviii, 1921, p. 256. The larvae of this species are grassy-green all over, save for the pale yellowish head with dark markings between the eyes

and on the vertex. Just under the transparent skin of the example collected at Puttenham could be seen a long thread-like worm; no actual measurements were taken, but I should say that the larva was about 0.6 in. long, and that the worm curled up inside it was considerably longer. The larva was killed and preserved in spirit, and was subsequently submitted to Dr. H. A. Baylis of the British Museum. He tells me that it is the larval form of a species of *Mermis* (Nematoda), but impossible to name. 'These worms,' he writes in a letter dated April 30th, 1925, 'pass their larval stages in insects or other invertebrates, emerging when fully grown but still sexually immature to complete their life-history in the ground or in water. It is usually impossible to determine the larvae, and the best thing is to endeavour to keep them alive until they become mature (which may take as long as two years in some species). The record of "*Filaria*" in a sawfly [see Dr. David Sharp, "The Cambridge Natural History," Vol. V (Insects, part 1), 1895, p. 516] doubtless referred to a worm of this type, as the term *Filaria* used often to be loosely applied to any worm of an elongated, *Filaria*-like shape . . . Very little is known of the life-history of most of the species.' No detailed search of the literature has been made for records of like cases of parasitism, but Enslin makes the general statement that thread-worms are known to parasitise sawflies. [Tenthredinoidea Mitteleuropas, p. 20 (Deutsche Ent. Zeitscher. 1912, Beiheft).]—R. B. BENSON, B.A., F.E.S., Boldre House, Berkhamsted, Herts. : April 1926,

British species of Protura—a request.—Intensive collecting of Protura in the Bristol district has brought to light no fewer than five species of this little-known order, four of them being apparently new to science, and one not yet recorded from this country. In describing these species in the near future I hope to give a resumé of the known British forms, with analytical tables for their specific determination. I should be very grateful therefore if entomologists would allow me to examine any specimens they possess (preferably in spirit), giving me permission, where necessary, to mount them.—H. WOMERSLEY, Sunny Meads, West Town, Somerset : May 17th, 1926.

Periodicals, etc., received.

(Continued from p. 102.)

British Museum (Natural History). Picture Postcards.—Sets E 39-42 . 39, Exotic Butterflies ; 40, Exotic Moths ; 41, Exotic Beetles ; 42, Hymenoptera. Economic Series, No. 1A.

'The House-fly, its life-history, importance as a disease carrier, and practical measures for its suppression.' by Major E. E. Austen, D.S.O. Second edition, 1926. Price 1/-.

Instructions for Collectors :

No. 7.—'Blood-sucking flies, ticks, etc.', by Major E. E. Austen, D.S.O. Fifth edition, revised and enlarged, 1926. Price 6d.

Annals of Tropical Medicine and Parasitology, Vol. XX, No. 1, Feb. 1926.

Three entomological papers are included in this number : (1) 'Breeding-places of Anopheline Mosquitos in and around Freetown, Sierra Leone,' by D. B. Blacklock and A. M. Evans ; (2) 'Notes on Freetown Mosquitos, with descriptions of New and Little-known Species,' by A. M. Evans ; (3) 'The Mouth-parts, Alimentary Tract, and Salivary Apparatus of the Female of *Phlebotomus papatasi*,' by S. Adler and O. Theodor.

The Dictionary of Entomology, by N. H. Jardine, pp. 259, 8vo. (Janson and Son, London. Re-issue at lower price, 5/-, cloth.)

Comprises the explanation and derivation of about 2,500 terms used in Entomology. A few copies of this work appear to have been issued by the author at Ashford, Kent, in 1913. The terms selected are taken from the writings of certain well-known authors whose names are given. The dictionary, however, does not include many words in constant use, such as 'frenulum' (the connecting bristle by which the wings of most moths are united to the retinaculum in flight), figured by South in his 'British Moths' and adopted by all writers on Lepidoptera, etc. etc. This little book is very clearly printed on good paper, and in spite of its brevity it cannot fail to be of use to entomologists generally. To give a complete list of all the terms in use in Entomology fully twice as many pages would be required.

Australian Zoologist, Vol. IV, Pt. iii, pp. 117-163, pls. 16, 17, Feb. 1926. Reprint.

'A Check List of the Australian Tenebrionidae,' by H. J. Carter.

This list contains the names of 28 sub-families, 169 genera, and 1,085 species, an increase on the valid genera and species of Masters' Catalogue (1886) of 72% in the genera and of 155% in species. As the author states, the large number of apterous forms and the sluggish habits of the Tenebrionidae give them a special value in zoo-geography. Of the 169 genera, 128, or more than 75% are endemic, including those characteristic of the inland fauna, such as *Helaeus*, *Saragus*, *Nyctozolus*, and *Adelium* and its allies. The curious genus *Tretothorax* Lea, an insect living in ants' nests, is figured on pl. 16, fig. 2; it shows some relationship with the American fauna, and has been referred to the Dacoderinae by Blair (cf. E.M.M., 1918, pp. 152, 153). *Synercticus* Newm. and *Tanylypa* Pasc., referred by some authors to Pythidae, on account of their open anterior acetabula, are treated as aberrant members of the Tenebrioninae. The author has studied the Tenebrionids for many years, and has verified the synonymy of the critical species during visits to his native land. Blackburn's types were acquired some years ago by the British Museum.

Agricultural Journal of India, Vol. XXI, Jan. 1926.

This number contains an appreciative notice and portrait of the late Professor Harold Maxwell-Lefroy, by M. Afzal Husain.

Agricultural Research Institute, Pusa, Bulletin No. 162, 1925, issued in 1926.

'Tentative Keys to the Orders and Families of Indian Insects,' by T. Bainbrigge Fletcher.

The necessity for keys of this kind has been felt for many years past by everyone who has attempted to classify Indian insects, and none are given in 'Lefroy's Insect Life,' even to the nine Orders recognised in that work. They are largely modelled on Brues' and Melander's 'Keys to the Families of N. American Insects,' modified to suit the components of the Indian fauna. As regards the Coleoptera, no mention is made of Fowler's keys to the families given in the Introductory Volume of the 'Fauna of British India' (1912), and the three additions to that list, the Hydroscaphidae, Sphaeriidae, and Thorictidae (the names of each of which were placed by him within square brackets as not belonging to the Indian fauna), all recorded in this Magazine in 1920 or 1923, are omitted.

University of Toronto Studies, Biological Series, No. 26, pp. 202 and 35 plates, 1925.

'The North American Dragonflies of the genus *Somatochlora*,' by E. M. Walker.

21 species are enumerated and maps showing the distribution of each of them given in the text.

U.S. Department of Agriculture, Dept. Bulletin No. 1357, Jan. 1926.

'The Strawberry rootworm, a new pest on greenhouse roses,' by C. Weigel.

This American Chrysomelid beetle, *Paria canella* (F.), and its varieties *quadrinotata* (Say) and *gilvipes* (Crotch), appears to have been known for the last forty years as the strawberry rootworm or strawberry leaf-beetle, and has now been found to damage roses in two widely separated localities in the United States. It belongs to the sub-family Eumolpinae of the Chrysomelidae, of which there is no British representative.

Papers of the Michigan Academy of Science, Art, and Letters, Vol. V, 1925. Reprint.

'Phylogeny and Phylogenetic tendencies of Gyrinidae,' by Melville H. Hatch.

Bulletin of the Brooklyn Entomological Society, Vol. XX, No. 3, June 1925. Reprint.

'An Outline of the Ecology of Gyrinidae,' by Melville H. Hatch.

Journal of the New York Entomological Society, Vol. XXXIII, Dec. 1925. Reprint.

'Habitats of Coleoptera,' by Melville H. Hatch.

The author divides his list of habitats into three groups: (A) Associated with the physical environment; (B) Associated with living organisms; (C) Associated with disintegrating organic remains. These again he sub-divides into thirteen smaller sections. The term 'Edificarian' is used to imply association with the habitation of man (species of *Anthrenus*). *Leptinus testaceus* is given as an ectoparasite on shrews, and certain Staphylinids are mentioned as occurring with opossum, mouse, and guinea pig in S. America.

Eos, Tomo I, No. 4, Dec. 1925.

Includes three entomological papers: (1) 'Fourmis d'Espagne et autres espèces paléarctiques,' by F. Santschi; (2) 'The Ethiopian species of *Macropsis* Lewis (*Pediopsis* auct.) (Homoptera, Bythoscopidae),' by W. E. China; (3) 'Orthoptera palaeartica critica,' I. Contribution à la connaissance des Scobieae (Gryll.), by I. Bolivar.

Treubia, Recueil de Travaux Zoologiques, Hydrobiologiques et Océanographiques, Vol. VIII, livr. 1, 2, Janvier 1926.

This work is published at Batavia, Java, and often includes entomological papers, the present livraisons (pp. 1-198), however, are entirely devoted to an article on 'Malayan Acari' by Graf Hermann Vitzthum, of München. In Vol. VI, livr. 2 (pp. 174-198), 1925, there is a paper on 'New Staphylinidae from the Dutch East Indies,' by Malcolm Cameron. Each volume includes four livraisons, published at irregular intervals.

Philippine Journal of Science, Vol. XXXIII, 1925. Reprints.

'Neue Hoplionoto-arten (Coleoptera, Chrysomelidae, Cassidinae) aus den Philippinen, II,' by F. Spaeth; 'Brenthiden der Entomologischen Sammlung des Bureau de Science,' etc., with one plate, by R. Kleine; 'Description de trois espèces nouvelles de Galerucini des Philippines,' with a figure of *Oides bakeri*, sp. n., by V. Laboissière.

Notulae Entomologicae, Vol. VI, No. 1, 1926.

Contains papers by R. Krogerus ('Studien über *Choleva*-Arten'), W. Hellén ('Hemipt. Notizen aus Finland'), M. Hering ('Ist *Gelechia anacamptoidella* Her. eine gute Art?'), H. Lindberg ('Zur Kenntnis der paläarktischen Cicadina,

III'), R. Forsius ('Ueber *Heptamelus javanus* Ens. [Hym. Tenth.], etc. The *Choleva* paper is of particular interest to British Coleopterists, as all our species, except *C. spadicea* Sturm, are found in Finland, including *C. glauca* Britten. A new species is described under the name *aquilonia*, the ♂ differing from that of *C. agilis* in the acutely-produced median lobe of the aedeagus, and the less pointed inner and distal angular prolongations of the posterior trochanters. The genitalia of the ♂ and ♀ of each species are figured, following the system adopted by Jeannel.

Academia Romana Memorile Sectiunii Stiintifice, Seria III, Tom. III, Mem. 7, pp. 257-383 (sep. pag. 1-129), with 2 plates, 1925. [Dec. 23rd.]

'Ueber Chinas Pyraliden, Tortriciden, Tineiden nebst kurze betrachtungen, zu denen das studium dieser fauna veranlassung gift,' by Aristide Caradja.

This paper gives a list of the described species of the groups of Lepidoptera mentioned, with the general distribution of each of them. Some of the new forms are described by the author, and others, eleven in number, by Mr. E. Meyrick. Mr. Tams, too, has helped in the identification of various species. The 74 photographic uncoloured figures given on the two plates, all reduced in size, will doubtless help in the identification of many of the insects, others, taken from damaged specimens (57, 60, 66, 68, etc.), are useless. 726 species or forms are enumerated, 325 of which are new to the Chinese fauna. The Pyraustinae include nearly half (315) of the total number listed. Various Indian species with varietal forms in China are noted on p. 277 (21).

Annales Societatis Zoolog.-botanicae Fennicae Vanamo, Tom. 4, Nos. 1, 2, Helsingfors, 1926.

These two numbers contain papers by the late John Sahlberg, edited by his son Uuno Saalas.

1. 'Enumeratio Coleopterorum Fenniae.—Lamellicornes, Platysoma, Xylophagi, Fungicola.' The first group includes Scarabaeidae and Lucanidae; the second ('Platysoma') Cucujidae and Trogositidae; the third ('Xylophagi') Colydiidae, Ptinidae, Anobiidae, Aspidophoridae, Bostrychidae, Lyctidae and Cidae; the fourth ('Fungicola') Lathridiidae, Cryptophagidae, Tritomidae, Endomychidae and Mycetophagidae.

2. 'Die *Cryptophagus*-Arten Finnlands.' Forty species are enumerated (under three sub-genera) and a key to them is given. Nearly half of these do not occur in Britain, but *C. pubescens* Sturm is absent, though found in S. Sweden.

Reviews.

'SEA-GIRT JUNGLES.' The Experiences of a Naturalist with the 'St. George' Expedition. By C. L. COLLENETTE, F.E.S. (London: Hutchinson and Co., Ltd., Paternoster Row. 1926.)

This handsome volume is one of the first results of the voyage of the well-appointed auxiliary steam yacht 'St. George,' under the auspices of the Scientific Expeditionary Research Association.

The vessel sailed from Dartmouth late in April 1924, and was absent from England for a period of seventeen months, eight of which were spent in the Eastern and Central Pacific Ocean, and it is with this portion of the voyage that the book is concerned. In addition to Coiba, Gorgona, Cocos, the Galápagos and other islands adjacent to the American Continent, the Marquesas, the Tuamotu or Low Archipelago, Tahiti, Moorea, and the remote Rapa, Rurutu and Easter Islands were visited in the course of the cruise, though it was found impossible to touch at several islands of special interest included

in the original programme. The large collections in all departments of Natural History made by the eight scientific experts who were borne in the 'St. George' are now in process of being worked out, with the certainty of results of high interest and value, especially as regards the geographical distribution of living organisms, and our knowledge of the rapidly vanishing flora and fauna of these islands, their original human inhabitants unfortunately not excepted.

The author of the work under notice, besides holding the office of Secretary to the Expedition, was responsible for the investigation of the Lepidoptera and Coleoptera of the localities visited, and in the lady passenger to whom the volume is gracefully dedicated he found a capable and enthusiastic colleague. The story of their experiences and adventures in pursuit of moths and beetles is graphically narrated, and the energy with which the work was carried out is manifest from the statement that the 'mothing-screen' for attracting insects by light was set up on no fewer than eighty-seven occasions in sixteen different islands; often under no small difficulty as to landing, etc., and in a great variety of situations, from the steaming tropical forest of Gorgona to the bare wind-swept downs amid the colossal statues of Easter Island, and from sea-level in the Tuamotu atolls to the bleak summit of Mount Temetio in Hiva-Oa, the highest point in the Marquesas Islands. As might have been expected in these Islands, the number of species of moths attracted by this method was not very great, but several were individually most abundant, and no fewer than 437 specimens of some twenty-five species were secured in one night's work on Temetio at an elevation of nearly 4,000 feet. The most important 'find' in the limited but highly interesting butterfly fauna of the Islands was a new and most distinct species of *Libythea*, which was seen, but not caught or recognised by the writer of this notice in the Marquesas more than forty years ago. The re-discovery of this insect extends the range of this singular genus of butterflies eastwards from the Loyalty Islands for more than 3,000 miles.

But Entomology forms only a portion of this brightly written and highly attractive book. The scenery and vegetation of the Islands are vividly portrayed, and many delightful sketches of their native inhabitants are given. In particular the chapter on the Galápagos, with their 'quaint trusting folk' of sea-lions, birds, and great marine lizards, presents a striking picture of these most interesting Islands. With regret we note (p. 115) that this wonderful 'precinctive' fauna is exposed to the danger of commercial exploitation of the group, which cannot fail to seal the fate of many of these peculiar forms of life. Perhaps it is not too much to hope that one island at least of the Archipelago, which can be of little value in all other respects, may be acquired by the associated Naturalists of Europe and America as a 'Nature Reserve,' to be dedicated for all time to the immortal memory of their first scientific explorer, Charles Darwin.

The thirty-seven excellent illustrations are all reproduced from photographs taken on the voyage of the 'St. George,' and add greatly to the value of this most interesting book, which we cordially recommend to the notice of Naturalists in general, as well as to all who respond to the romance of the South Sea Islands.—J.J.W.

Society.

ENTOMOLOGICAL SOCIETY OF LONDON: *Wednesday, March 17th, 1926.*—Professor E. B. POULTON, F.R.S., President, in the Chair.

The following were elected Fellows of the Society:—H. A. B. Harmsworth, 3 Marlborough Gate, Hyde Park. W.2; Professor C. H. Kennedy, Ohio State University, Columbus, Ohio, U.S.A.; K. Mansour, B.Sc., Royal College of

Science, South Kensington, S.W.; A. P. G. Michelmores, Saffron Close. Chudleigh Devon; A. el Mistehawi, c/o Egyptian Educational Mission, 28 Victoria Street, S.W.; T. A. N. Nash, 16 Queen's Road, Richmond, Surrey; N. F. Newey, Craigmores, Coleshill Street, Sutton Coldfield; J. Shibuya, Hokkaido Imperial University, Sapporo, Japan; G. S. Skinner, Usine Ste. Madeleine, Trinidad, B.W.I.; H. Womersley, Sunny Meads, West Town, nr. Bristol.

Dr. E. A. Cockayne exhibited a specimen of *Cosymbia linearis* Hb., ab. *fasciata* Prout, from Epping Forest. Mr. G. Talbot, abnormal examples of *Morpho menelaus* L., from French Guiana, and of *Charaxes doubledayi* Auriv., from the Kameruns. Professor E. B. Poulton exhibited and made remarks upon the following:—(a) The tailed *niavoides* female of *Papilio dardanus hodsoni* taken with its model in South-West Abyssinia by Mr. Arnold Hodson; (b) A procrystic Tettigoniid (Locustid) and moth taken in Costa Rica by Mr. C. H. Lancaster; (c) Insects, etc. of bionomic interest collected in Uganda by Dr. G. D. H. Carpenter; (d) *Melanitis leda* with injuries probably caused by house lizards, captured in Batavia by Mr. H. W. Simmonds; (e) The migration of *Belenois mesentina*, at Nairobi, by Rev. Canon K. St. Aubyn Rogers and Dr. V. G. L. van Someren; (f) Further confirmation of attacks by larval *Hyperichia* on the larvae of Xylocopid bees at Nairobi, by Dr. V. G. L. van Someren; (g) Ants and their mimics collected at Como by Mr. S. Stuart Light. Rev. F. D. Morice made remarks upon a method of making outline drawings from photographs.

The following papers were read:—(1) 'Further Records of Insect Migration,' by Mr. C. B. Williams, M.A.; (2) 'Homocosis and Heteromorphosis in Insects,' by Dr. E. A. Cockayne, M.A.; (3) 'On the type specimens of Hesperidae (Lep.) described by Latreille,' by Dr. N. D. Riley; (4) 'Insect Visitors to Sap-exudations of Trees,' by Mr. G. Fox-Wilson.

Wednesday, April 7th, 1926.—Dr. H. ELTRINGHAM, Vice-President, in the Chair.

The following were elected Fellows of the Society:—Miss J. Barrington, B.A., St. Leonard's School, St. Andrew's, Scotland; Mrs. O. A. Merritt Hawkes, M.Sc., B.Sc., 405 Hagley Road, Edgbaston, Birmingham; V. V. Nikolsky, Cotton Committee, Arminnsky, per 2, Moscow, Russia; Dr. G. H. Skaife, M.A., Dept. of Education, Cape Town, South Africa.

Mr. H. M. Edelsten, on behalf of Mr. Gurth Edelsten, communicated particulars of the larva and pupa of *Rhodafra opheltes*. Mr. N. D. Riley, on behalf of Mr. T. F. Marriner, communicated some notes on a Coccinellid believed to be a hybrid between *Adalia bipunctata* L. and *Coccinella 10-punctata* L. (*variabilis* Ill.). Mr. C. B. Williams drew attention to an old record of the hibernation of *Pyrameis cardui* in caves in England, and some discussion took place on the hibernating habits of several allied butterflies.—S. A. NEAVE, Hon. Sec.

NOTES ON THE EMPIDIDAE (DIPTERA) WITH ADDITIONS AND CORRECTIONS TO THE BRITISH LIST.

BY J. E. COLLIN, F.E.S.

These 'Notes' are really a summary of many years' work on the preparation of a volume of the 'British Flies' series dealing with the Empididae. The publication of this volume in the immediate future being improbable, and the need of a new edition of

the 'List of British Diptera' so urgent, it is felt advisable to make public as soon as possible, if only in an abbreviated form, the numerous alterations and additions to the recorded British species in this particular family.

Subf. TACHYDROMINÆ.

DRAPETIS MEIG.

The British species of *Drapetis* may be divided into two subgenera. The first, *DRAPETIS* sens. strict. (type *exilis* Meig. = *pusilla* Lw.) has the eyes extending downwards practically to the mouth-opening; the 'jowls' therefore only linear below the eyes; two pairs of small ocellar bristles; tibiae not spurred; mesopleurae with short hairs on the upper hind corner. The second, *CROSSOPALPUS* Bigot (type *ambiguus* Macq. = *flexuosa* Lw.), has distinct 'jowls' below the eyes; only one pair of ocellar bristles; tibiae spurred, and mesopleurae quite bare. It is probably correct to treat *ELAPHROPEZA*, which has linear jowls, bare mesopleurae and bristles above the hind tibiae, as a third subgenus of *Drapetis*.

Subg. *CROSSOPALPUS*.

D. curvipes Meig. (*aterrima* Curtis). The *Tachydromia nigra* Fall. of Fallen's and Zetterstedt's collections is identical with *aterrima* Curt., but in 1822 Meigen pointed out that the *T. nigra* of Fallen was not the same species as the *T. nigra* he (Meigen) had previously (1804) described, and re-named Fallen's species *curvipes*, by which name that species must in future be known. Other synonyms are *moriella* Zett., and *picipes* Zett., according to the type specimens at Lund, while Lundbeck described the species as *setigera* Lw., his *aterrima* being *nigritella* Zett. (*nervosa* Lw.). This last misidentification was largely due, I believe, to an unfortunate mistake in the labelling of specimens sent by the late Mr. Verrall to Mr. Lundbeck.

D. nigritella Zett. (*nervosa* Lw.). A male labelled 'Lund' and a female labelled 'Scan' in Zetterstedt's collection are the same as the *D. nervosa* of our 'List' and the *D. aterrima* described by Lundbeck; two other males in the same collection without locality labels are representatives of *D. humilis* Frey. I accept the first two as being typical of Zetterstedt's species.

Other British species of this subgenus are:—

D. setigera Lw. Resembling *curvipes* Mg., but third antennal joint rather shorter, middle tibiae with a small antero-dorsal bristle near base and hind femora with a bristle or two above near tip.

Col. Yerbury caught this species on the Dorsetshire coast between Studland and Sandbanks in August, 1909, and May, 1912. These specimens agree with some labelled *D. setigera* in a collection of Diptera from Kowarz. The closely allied *D. pilipes* Lw. has a much more distinct projection at tip of hind tibiae behind and the bristles on hind tibiae arranged in irregular pairs.

D. humilis Frey. Resembling a small *nigritella*, but front coxae yellowish and discal vein more bowed.

Quite a common species under heaps of cut sedge in Chippenham Fen (Cambs.) in the winter, in company with *nigritella*, and on a stable window here at Newmarket (Suffolk) in the summer in company with *assimilis* and *exilis*. Frey considered it to have some decided association with horse-dung.

D. minima Meig. Like a small *nigritella* or large *humilis*, but legs entirely pale reddish-yellow with the tip of hind femora slightly brownish. Halteres pale yellow.

Found by the late Mr. F. Jenkinson in his garden at Cambridge, by the late Mr. Piffard at Felden (Herts), and by myself at Kirby-le-Soken (Essex). *D. minima* has been placed as a synonym of *assimilis*, but Meigen's description is so entirely applicable to the above species, and not to *assimilis*, which has dark halteres, brownish legs, and belongs to the subgenus *Drapetis*, that I have no hesitation in using the name *minima* for what is apparently an overlooked species. I could find no type specimen of *minima* in Meigen's Collection at Paris, but the *D. minima* of Zetterstedt's Collection is certainly only *assimilis* and not, as has been suggested, a synonym of *arcuata* Lw.

Subg. DRAPETIS.

D. arcuata Lw. Distinguished from *assimilis* by the more even curve of radial vein, the absence in the male of a ciliation of pale, long, outstanding, postero-ventral hairs beneath hind femora, and differences in the male genitalia.

This species has been found in Cambridgeshire by myself and the late Mr. F. Jenkinson, and in Herefordshire by the late Dr. J. H. Wood. My specimens were bred from the debris of an owl's nest in a hollow willow tree at Wicken, and from material obtained from a hollow sappy horse-chestnut tree at Snailwell. Mr. Jenkinson's specimen was found also on sap exuding from a tree at Cambridge.

D. exilis Meig. (*pusilla* Lw.). The types of *exilis* in Meigen's collection at Paris are not the species described as *exilis* by Loew and Lundbeck, but are the same as their *pusilla*, and Meigen's description of the wings as 'glasartig' corroborates the evidence of the types. The species we have been calling *pusilla* must in future be known as *exilis*, and the *exilis* of Loew and Lundbeck requires a new name, which I suggest should be *incompleta* in reference to the fading away of the cubital vein towards its end. The *D. exilis* of Zetterstedt's 'Ins. Lapp.' was *D. assimilis*, but a male in the 'D. Scand.' collection labelled 'Lindholm,' and the *D. nigripes* ♀ in Roth's collection were the true *exilis* Meig.

D. parilis, n. sp., ♂ ♀. Resembling *exilis* Meig., but with rather less strongly upcurved radial vein and consequently narrower marginal cell to

wings; male genitalia differing in the shape of the process from left lamella, which is not spatulate, and pointing across to the right as in *exilis*, while the hairy cowl-like process to right lamella is broader.

Length 1.5-1.75 mm.

Known to me from Herefordshire (taken by Dr. J. H. Wood), Nottinghamshire (taken by Prof. J. W. Carr) and Essex (taken by myself at Great Oakley on July 17th, 1912).

D. convergens, n. sp., ♀. Cross-veins wide apart as in *assimilis* and *arcuata*, but prothorax dusted greyish, not polished black, legs entirely yellowish and halteres pale yellow. Wings rather narrower than usual, and of a slightly yellowish tint with brownish-yellow veins, the sub-costal and radial veins long, of equally slight curvature, the costal and sub-costal cells narrow; both cubital and discal veins rather undulated but converging towards the tip. *D. flavipes* is larger, has the two basal antennal joints yellowish, the arista very long and more pubescent, the thoracic pubescence longer and the discal veins not upcurved towards cubital at tip.

Length 1.75 mm.

A single female of this very distinct species was caught by me at Orford (Suffolk) on August 26th, 1907.

STILPON Lw.

S. nubila, n. sp., ♂ ♀. Resembling *lunata* in size and general appearance, but costal margin of wing without a hyaline space about middle, only base and tip and hind-margin of wing clear.

This species occurred at Studland (Dorset) on August 19th and 20th, 1906, and I have seen a female taken by Mr. F. W. Edwards at Humphrey Head, N. Lancs., early in July, 1913, and another female taken by Mr. Halbert, of Dublin, on Lambay Island off the coast of Meath, in October, 1906. Mr. Lundbeck tells me that he takes it not uncommonly in Denmark, but at present in only two localities. Walker described his *lunata* from a female in Haliday's Collection, which I have examined; his figure of a female on Plate V, however, is not *lunata*, but my new species *nubila*. *S. nubila* is also the *graminum* var. β of Fallen's and Zetterstedt's Collections.

CHERSODROMIA Walk.

C. difficilis Lundbk. (*cursitans* Brit. List nec Zett.). This species differs from the true *cursitans* Zett. in having only two vertical bristles (instead of two pairs), no posthumeral bristle, anterior tibiae with small bristles above, legs a little shining, wings rather broader, radial vein longer and discal vein more undulating. *C. cursitans* Zett. had better be placed for the present in the List of Reputed British Species.

TACHYPEZA Meig.

T. truncorum Fall., ♀. Post-vertical bristles some distance behind upper corner of eye; palpi with pale bristles; front tibiae not much dilated or darkened; wings not whitish at tip; acrostichal row of punctures very wide apart about middle.

I have seen only two British females of this species, one taken by Mr. F. Jenkinson at Dunphail (Elgin) on July 6th, 1902, and the other by Mr. C. G. Lamb at Nethy Bridge (Inverness) in July, 1905.

The *T. nervosa* Mg. mentioned by Grimshaw, Scot. Nat. 1907, p. 153, is a synonym of *nubila* Mg.

There is a *T. praelusio* Walk. in the List—a species which has not been recognised by any subsequent writer. From the description I can only imagine that *praelusio* was *Stilpon graminum* and that the *T. graminum* mentioned at the same time by Walker was some other species, probably not a *Stilpon* at all.

TACHISTA Lw.

T. aemula Lw. This name was added to the British List on the strength of a specimen returned with that name by Loew to Verrall. The specimen is a male, and a most searching examination fails to bring to light any reliable distinction from the common *T. arrogans*. The name *aemula* Lw. may therefore be struck out of the List.

T. tuberculata Lw. Added to the British List by Verrall (Ent. Mo. Mag. 1911, p. 79, 1912, p. 26) was a misidentification. The specimens upon which it was introduced, supplemented by others (including males) taken in the same locality, prove to be the sub-species *morio* Zett. of *connexa*. True *tuberculata* must differ (*inter alia*) in having the male front tibiae with shorter pubescence beneath and its middle tibiae simple (*i.e.* without the flattened apical projection beneath).

T. connexa Meig., sub-sp. *morio* Zett. *nec* Wlk., appears to differ from *connexa* only in having in both sexes more distinct (perhaps chiefly because darker) tiny bristles antero-ventrally on front femora, and in the male the second joint of middle tarsi longer, almost as long as first.

In addition to the Monnow River locality this form has been found in Scotland (Rannoch and Loch Assynt), Westmorland (shores of L. Ullswater), and Suffolk (Barton Mills). All Zetterstedt's specimens of *morio* belonged to this subspecies, typical *connexa* was absent.

T. halidayi, n. sp. (*morio* Walk. *nec* Zett.), ♂ ♀. A very small species (length about 1.5 mm.) with the whole of occiput, prothorax, and front of front coxae, silvery-grey; wings with two broad, rather faint brown bands indistinctly connected along costa. Legs brownish-black with base of all tarsi yellowish; femora and tibiae without any distinct spines or bristles in either sex. Halteres yellow with brownish base to stem. *T. aliterpicta* Beck. has all the occiput, except just above neck, shining black, the two bands on wing very broadly connected above, and the legs paler. *T. lundstromi* Frey. is apparently larger (length 3 mm.) and has the front femora with 'die gewöhnlichen Stacheln' beneath.

I have examined the pair in the Dublin Museum taken by Haliday, from which Walker described his *morio* and another pair

in the Cambridge Zoological Museum taken by Dr. D. Sharp at Beattock (Dumfriesshire) in July, 1907.

T. halterata, n. sp., ♂ ♀. A shining black species with silvery prothorax; the outer two-thirds of wing, on at least the costal half, darkened; halteres blackish. The occiput very slightly dusted with greyish on the upper part. Legs black, with the front coxae and trochanters, basal third of front, basal quarter of middle, and extreme base of hind femora, yellowish; anterior knees narrowly, and sometimes the base of anterior tarsi, also yellowish. The middle femora of male with a rather shallow excision near base beneath, with a small spinose bristle at beginning and end of the excision, and other still shorter bristles; middle tibiae slightly concave ventrally just before tip, but with only a very slight apical projection.

Length 1.6-2 mm. (the females being the larger).

I possess specimens from Norfolk, Suffolk, Cambs, Herts and Kent, but the species has never been found in any numbers. The male from Darenth (Kent) was taken by Mr. H. Donisthorpe 'with *Lasius fuliginosus*.'

T. woodi, n. sp., ♂ ♀. Resembling a small *annulimana*, but without strong spinose bristles on hind part of disc of thorax and only very small bristles on scutellum; middle femora with only tiny bristles beneath, very little longer about base, but yellowish in colour there; middle tarsus shorter than the tibia. The occiput only dusted on the upper part and vertex. Wings and halteres as in *annulimana*, but the cubital vein apparently thicker and darker throughout its whole length.

Length 2-2.25 mm.

The types of this species consist of two males and a female taken by Dr. J. H. Wood on the river Monnow (Herefordshire) on July 20th, 1909, July 25th, 1911, and July 18th, 1913, and now to be found in Dr. Wood's Collection, at present on loan to the Natural History Museum, South Kensington.

TACHYDROMIA Meig.

Among the species of this genus there are a certain number which have two pairs of vertical bristles, one pair convergent and one pair divergent. The species already in the British List possessing this extra pair of vertical bristles are: *maculipes* Meig., *agilis* Meig., *nigritarsis* Flin. and *longicornis* Meig. If it be thought desirable that this section should have a name, it would appear necessary to use that of *Phoroxypa* Rond. with type *longicornis* Meig. I am content to follow Zetterstedt and Lundbeck in the use of the name *maculipes*, having compared their specimens with British ones, though even the middle femora are often quite without dark markings; it is the species I have distributed to correspondents under the MS. name of *subnotata*.

The following species also belong to this group:—

T. pulicaria Meig. A small (length 1.25-1.75 mm.) species, with thorax

dusted light greyish, basal joints of antennae yellowish, all thoracic hairs and bristles pale yellowish, legs yellow with a short, pointed, dark, apical spur to middle tibiae. Third antennal joint about half as long again as deep, shorter than arista, and dark greyish-brown. Tarsi not annulated. Acrostichals quadriserial.

I have seen specimens from Herefordshire, Hampshire, Oxford, Essex, Suffolk and Cambs, and have examined and compared Meigen's types in the Paris Museum. *T. immaculata* Beck., from Egypt, is extremely closely allied.

T. rapida Meig. A small (length about 2 mm.) species with short dark antennae having the third joint broad, ovate and shorter than the arista. Thorax dusted greyish with dark brown or almost black bristles, the acrostichals quadri-serial. Legs yellow with middle femora and end half or more of hind femora darkened; middle tibiae with a strong, pointed apical spur, only the last joint of all tarsi darkened.

Has occurred sparingly in Kent, Hereford, Nottingham and Cambs, and been compared with Meigen's types in Paris.

T. interjecta Lundbk. British specimens agreeing with Lundbeck's types have the acrostichal bristles irregularly bi-serial (almost uni-serial in front) and somewhat diverging. In the male there is a tiny curved black spine at tip of middle tibiae beneath which is absent in the female.

Found only in Scotland, by Col. Yerbury at Brodie (Elgin) and Golspie (Sutherland), and by myself at Dornoch (Sutherland) and Aviemore (Inverness).

T. incerta, n. sp., ♂ ♀. Basal joints of antennae somewhat yellowish, third joint short, ovate, black, shorter than the arista. The stronger bristles of head and thorax black or brownish-black; acrostichals quadri- to multi-serial, very short. Abdomen shining black, male hypopygium small. Legs yellow, with the four posterior femora more or less darkened on apical half or more, and the joints of all tarsi, usually very narrowly and faintly brownish towards tip; middle tibiae with a very slight apical projection but no spur.

Length 2-2.25 mm.

I have taken this species at Kirtling (Cambs) and Mr. Verrall has a female from Bournemouth (Hants), while there were a pair in a collection made by Dr. Capron probably taken in the neighbourhood of Shere (Surrey).

T. aurantiaca, n. sp., ♀. Closely resembling *albomicans* Oldenb., being of the same yellow colour, only very slightly dusted greyish, the first two antennal joints are however quite yellow, and the third joint brown but yellowish about base; this third joint is about $2\frac{1}{4}$ times as long as deep at base and rather longer than the short arista. Acrostichals only bi-serial and somewhat diverging. The stronger thoracic bristles yellow. Middle femora not so strong as in *albomicans*; middle tibiae with a tiny projection beneath at tip, but no spine or spur.

Length about 2.25 mm.

Two females only, one taken by Mr. Verrall at Orford (Suffolk) on June 20th, 1907, and the other at Timworth (Suffolk) on April 26th, 1912, by Col. C. G. Nurse.

T. stylisoides, n. sp., ♂ ♀. A small (length 1.25-1.5 mm.) shining black species. Frons wider than usual and shining black. Antennae very short, black, the third joint ovate, hardly half as long again as deep. Acrostichals bi-serial, the rows close together and the hairs somewhat divergent; the stronger thoracic bristles dark brown to black. Abdomen shining black. Legs yellow, with the posterior coxae about base, an indistinct patch above middle femora towards tip, and the apical half of hind femora, brownish; tarsi with only the last joint brownish; middle tibiae with a slight, blunt, yellowish projection at tip beneath.

One male taken at Lyndhurst (Hants) by Mr. Verrall on June 11th, 1885, and two females taken by myself at Studland (Dorset) on May 24th, 1912, and at Ivybridge (Devon) on May 17th, 1914.

T. agilella, n. sp., ♂ ♀. Remarkably like *agilis*, but much smaller (length 1.75-2 mm.); hypopleura as well as sternopleura extensively shining; cubital and discal veins more parallel; legs of the female yellow like those of male.

I caught a female at Aviemore (Inverness) on May 25th, 1913, and Dr. Sharp another female at Nethy Bridge (Inverness) in June, 1907, but specimens of both sexes stood under the name *articulatus* Mcq. in a collection of Diptera from Kowarz and were labelled 'Asch 24/5/75.' They cannot be Macquart's *articulatus* because that was described as having the basal joints of antennae yellow.

The next group is not so sharply defined as the previous one, as some species appear to merge into the third group. It must, however, be something more than a coincidence that all the species with a shining or partly shining disc to thorax should have the humeral bristle absent or very tiny, and only one pair of stronger dorso-central bristles on hinder part of thorax. Many of the species also have very short and weak vertical bristles, and these with a curve and direction of the same nature as the vertical pubescence. If a name be required for this group it would appear that *Cleptodromia* Corti must be used.

Species already in the British List belonging to this group are: *pallipes* Fln., *lutea* Meig., *pectoralis* Fln., *ciliaris* Fln., *albiseta* Panz., *stigmatella* Zett. and *minuta* Meig. This last is one of the intermediate species, inasmuch as the thorax is slightly dusted, but there appears always to be a less dusted median stripe.

Three other species have been added to the List: *albocapillata* Fln. by Grimshaw in 1912 (Proc. Roy. Irish Acad. xxxi, p. 25) and *macula* Zett. and *thoracica* Lund. by myself in 1913 (E.M. Mag. 1913, p. 130); this last species, however, according to Oldenberg (Deutsch. Ent. Zeitschr. 1924, p. 235), must in future be known as *ruficornis* v. Ros.

T. exigua Meig. of the 'List' also belongs to this group, but

will have to be known in future under another name, for Meigen's *exigua* was described from a specimen of *minuta*, as is proved by the type in Meigen's Collection in Paris and his description of the tarsi as annulated. On the other hand, Meigen's *T. nigra* described in 1804 and re-described in 1822 is the same as our species, as is proved by Meigen's types (four specimens) in Paris. Our species must be known in future therefore as *T. nigra* Meig. It has the disc of thorax shining black, without dust, a diagonal line of silvery pile on the pleuræ and the femora pale about base. Continental specimens appear to have usually a faint dusting on disc of thorax. I can record as British two other described species of this group, viz. :—

T. niveiseta Zett. Resembling *albiseta*, but frons a little wider on upper half, antennæ with a similar white arista much longer than third antennal joint, occiput without the greyish triangle behind ocelli of *albiseta*, pleuræ with only the sternopleura brightly shining, legs still paler with only the tips of tarsi brownish, and no long brownish hairs beneath front femora.

Dr. J. H. Wood caught a male at Churchyard Dingle (Herefordshire) on July 23rd, 1907, and I found a female at Chippenham (Cams) on June 25th, 1917.

T. confinis Zett. Resembling *stigmatella* Zett., thorax shining black with very few and tiny pale acrostichals and dorsocentrals; frons dull; antennæ shorter, third joint not much more than twice as long as deep and about two-thirds the length of arista. Legs yellow, the posterior femora and all tibiae sometimes a little brownish-yellow towards apex, and the last tarsal joint brown; bristles of hinder row beneath middle femora considerably longer than the tiny ones of front row; middle tibiae with only a slight projection beneath at tip.

Apparently a somewhat rare species in Scotland, found at Braemar (Aberdeen) by Mr. Verrall and at Nethy Bridge and Spey Bridge (Inverness) by Col. Yerbury. Specimens have been compared with Zetterstedt's types.

The following species of this group appear to be new :—

T. parvicauda, n. sp., ♂ ♀. Resembling *ciliaris*, but male hypopygium much smaller and last segment of female ovipositor not long and slender. Basal antennal joints brownish-yellow, third joint very small, arista long. Thorax with the few (bi- to tri-serial) acrostichals standing on a broad, otherwise bare median stripe, outside this stripe numerous pale hairs. Legs yellow with only the last tarsal joint brownish. Middle femora in the male with the postero-ventral row of bristles extending but slightly beyond middle with perhaps one or two tiny additional bristles right towards tip, in female complete.

Length 2.5–3 mm.

A widely distributed (though not common) species in the Southern half of England (Devon, Hereford, Brecknock, Hants, Notts and Cams).

T. calcarata, n. sp., ♂. Antennae short, basal joints yellow, third joint ovate, yellowish about base, shorter than the arista. Frons and thorax shining black, the latter a little dusted at sides, and with very few and minute, bi-serial, brownish acrostichals to uni-serial dorsocentrals. Pleurae extensively dusted. Legs yellow with only last tarsal joint brownish; middle femora very stout, middle tibiae with a very long, strong, curved spur darkened towards its pointed tip.

Length 2.5-2.75 mm.

Single specimens have been taken at Golspie (Sutherland) by Col. Yerbury on June 13th, 1896; at Wormsley Park (Oxford) by Mr. Verrall on July 12th, 1907; and in Herefordshire by Dr. J. H. Wood.

T. polita, n. sp., ♂ ♀. Closely resembling *thoracica* Lundbk., but third antennal joint rather narrower and distinctly dusky towards tip; upper half of prothoracic episterna and front of humeri polished in both sexes and not dusted greyish as in *thoracica*, female without the large dusted patch behind humeri.

Length 1.75-2.25 mm.

This species occurs in company with *thoracica*, but I have taken long series of each and find the above differential characters constant. It has been found in the counties of Glamorgan, Hants, Essex and Cambs.

T. ingenua, n. sp., ♂. Resembling *thoracica*, but antennae darker (somewhat damaged by moisture in type); vertical bristles much wider apart and longer; thorax shining right to front, only dusted on sides from humeri to scutellum, with a projection inwards towards disc behind humeri; whole of prothoracic episterna and humeri dusted; pleurae extensively shining; pale bi-serial acrostichals and uni- to bi-serial dorsocentrals longer and more conspicuous than in *thoracica*. A small but distinct humeral bristle. Legs yellow as in that species, but middle femora not so stout, knee of middle tibiae not darkened, and spur rather smaller.

Length about 1.5 mm.

A single male taken at Chippenham Fen (Cambs) on June 8th, 1921.

The next three species are somewhat intermediate between the second and third groups, inasmuch as the thorax is faintly dusted though not enough to entirely hide the ground colour. The first two are sufficiently distinct in general colour not to be mistaken for any other species of *Tachydromia*, while the third is so likely to be confused with *minuta* or *nigra* that it is better placed in the group which includes those species.

T. leucothrix Strobl., ♂ ♀. A small species with frons dull but whole of occiput brightly shining; antennae very small, basal joints yellow, arista long and white; thorax thinly dusted greyish, but pleurae extensively shining; acrostichals microscopic, bi-serial, dorsocentrals similar but uni-serial with one strong pair placed some distance from hind-margin; legs yellow with faintly brownish annulated tarsi, the last two joints almost entirely brownish; middle femora stout; middle tibiae with a strong pointed apical spur blackish towards its tip.

One female taken at Wormsley Park (Oxford) on August 4th, 1912, and one male and three females standing as *Tachydromia* sp. in a collection of Diptera from Kowarz labelled 'Bozen, 7. 6. 73.'

T. aenea Macq., ♂ ♀. Thorax shining aeneous-black, very faintly dusted and with rather long pale bristles and hairs, the acrostichals bi-serial, dorso-centrals uni-serial, ending behind in two longer pairs of bristles; frons and face very narrow; antennae black, third joint very short; legs black or dark mahogany brown with the front knees yellowish-brown; middle tibiae with a pointed apical spur.

A female taken at Porthcawl (Glamorgan) by Col. Verbury on July 9th, 1906, and a pair taken by Mr. A. H. Hamm at Bagley Wood (Oxford) on June 27th, 1908. *T. aeneicollis* Zett. is certainly a synonym.

T. albifacies, n. sp., ♂ ♀. Thorax shining black, only very slightly dusted greyish, with very short bi-serial acrostichals and uni-serial dorsocentrals, the latter ending in a rather longer bristle right behind; all bristles and hairs brownish to black. Antennae short and dark, third joint shorter than arista. Legs very dark, middle tibiae with a long sharp apical spur, tarsi very slender and not distinctly annulated. Resembling *minuta* but with darker, less pubescent legs (notably no fringe behind front tibiae and tarsi in the male), no projecting rim beneath tip of front tibiae, and more slender, not annulated, tarsi; from *nigra* it may be easily distinguished by its darker coxae and femora and its more extensively dusted pleurae. It may possibly be the *exigua* var. *nigrofemorata* of Strobl, 1909.

Length 1.75-2 mm.

A not uncommon species found up to the present in the counties of Surrey, Sussex, Hereford, Derby, Oxford, Suffolk and Cambs.

Of the species of the third group, with the thorax distinctly dusted, the single pair of vertical bristles and the humeral bristle well-developed, and usually two pairs of stronger dorsocentral bristles on hinder part of thorax, we will first deal with those having entirely black antennae. Those already in the 'List' belonging to this section of the group are *annulata* Fln., *notata* Meig., and *cothurnata* Meig. Of these *annulata* has quadri-serial acrostichals and *fascipes* Meig. is a synonym. The true *notata* Meig. is the species described by Lundbeck as *fulvipes*, but his *cothurnata* appears to be the same as ours. A fourth described species of this section is:—

T. strigifrons Zett. Closely resembling *notata*, having the third antennal joint as long as arista, as in that species, but front coxae are never darkened nor do the femora have darkened marks or bands. The left (or upper) of the two anal papillae of male hypopygium ends in a distinct short pointed spur or tooth, which is absent in *notata*.

Has occurred at Porthcawl and Bridgend (Glamorgan), Walton-on-Naze (Essex) and Nairn in Scotland.

The following species with black antennae do not appear to have been described :—

T. optiva n. sp., ♂ ♀. Antennae black, third joint quite three times as long as deep at base and longer than the arista. Acrostichals irregularly quadriserial, other bristles on head and thorax mainly black. Legs yellow with sharply black-annulated tarsi, the projection at tip of middle tibiae beneath ends in a tiny recurved point in the male, but is blunt and more trowel-like in the female. Front and hind tibiae with a few small bristles above.

Length 3·3–3·5 mm.

Has occurred at Porthcawl (Glamorgan), Tarrington (Hereford), Wormsley Park (Oxford) and New Forest (Hants) in July and August.

T. infecta, n. sp., ♂ ♀. Superficially resembling *strigifrons*. Antennae black with third joint elongate but hardly so long as arista. Vertical bristles closer together than in *notata* or *strigifrons*. Abdomen shining black with very small dusted basal side patches on first and second segments only, anal papillae of male hypopygium not hooked as in *strigifrons*. Legs yellow with annulated tarsi, front tibiae and middle femora stouter than in *strigifrons* and the 'knee' at extreme base of middle tibiae darkened. Spur to middle tibiae pointed. Pubescence of legs rather longer and more conspicuous than in *strigifrons*. *T. praecincta*, which has somewhat similar antennae and vertical bristles, has all the abdominal segments more distinctly dusted at sides, and in the female the sixth and seventh abdominal segments entirely dusted greyish.

Length 2·5–2·75 mm.

A male taken on my study window at Newmarket (Suffolk) on August 11th, 1884, and a pair taken at Brighton (Sussex) in August 1925 by Col. C. G. Nurse.

T. aristata, n. sp., ♂ ♀. Antennae black, third joint 2½–3 times as long as deep at base, arista about as long as third joint, slightly thickened and pubescent, giving the antennae a distinctive appearance. Vertical bristles very wide apart. Acrostichals bi-serial and short. The tarsi with only the faintest narrow brown annulations at tip of joints. Middle tibiae with a blunt, somewhat trowel-shaped spur at tip beneath. Wings slightly yellowish with yellow veins.

Length 2·25–2·5 mm.

Mr. Verrall caught three specimens at Wormsley Park, near Stokenchurch (Oxfordshire), on July 7th, 1909. I have taken it at Barton Mills (Suffolk) in May; Mr. A. H. Hamm near Oxford, and Mr. F. W. Edwards at Knebworth (Herts) also in May.

T. claranda, n. sp., ♂ ♀. Antennae black, third joint very short, ovate; thorax dusted almost a golden colour on disc, acrostichals bi-serial. Legs yellow with the tarsi distinctly annulated and the middle tibiae ending in a sharp pointed spur. It closely resembles *cothurnata*, but that species has only the faintest of narrow brown annulations to tarsal joints and the spur to middle tibiae in male blunt with a tiny recurved point at tip, and somewhat trowel-shaped in female without the point.

Length 1·5–2 mm.

Not an uncommon species from middle of June till August in widely distributed localities from Hampshire to Sutherland.

T. tantula, n. sp., ♂ ♀. Antennae black, third joint very short, ovate; thorax only thinly dusted, acrostichals bi-serial, very small; dorsocentrals uni-serial, distinctly longer. Legs yellow with tarsi distinctly annulated, and middle tibiae with a very short trowel-shaped spur in both sexes. The female of *cothurnata* most resembles this species in the shape of the tibial spur, but this in *cothurnata* is longer, the tarsi are not annulated and the dorsocentral bristles are not longer than the acrostichals.

I caught three males and seven females in one sweep of a hedge at Chippenham Fen (Cambs) on June 8th, 1921, and a male at West Stow (Suffolk) on June 6th, 1922. Mr. H. Britten has also taken the 'species in Westmorland in July.

The next two species also have black antennae and a short third antennal joint (much shorter than the arista), but are larger and have the legs with dark markings on at least the middle femora; in these characters they resemble *annulipes*, but always have the acrostichals bi-serial instead of quadri-serial as in *annulipes*. These were both included by Lundbeck and Zetterstedt under the name *flavipes* F. I do not use the name *flavipes* for either, because there is an older name of *flavipes* in the genus—that of Scopoli—and moreover neither of the two is identical with either of the two type specimens of *flavipes* F. in the Tonder Lund Collection at Copenhagen.

T. interstincta, n. sp., ♂ ♀. Frons as wide as third antennal joint; acrostichal bristles biserial, but the rows rather wider apart than usual, especially towards behind. Abdomen entirely shining black. Legs pubescent with the femora more or less marked or ringed with dark markings, and the tarsi always sharply annulated; middle femora not very much stouter than front femora; front tibiae in neither sex markedly dilated or spindle-shaped; middle tibiae with a strong sharp-pointed spur. Wings with the postical vein strong and darker than the other veins.

Length 2.25–3.25 mm.

A widely-spread and fairly common species.

T. coarctata, n. sp., ♂ ♀. Resembling *interstincta* but frons narrower; the dull coating to thorax more dust-like and less pile-like; acrostichal rows of bristles closer together. Legs normally more extensively darkened (at least in male); middle femora stouter; front tibiae in male distinctly more dilated and spindle-shaped and with longer posteroventral hairs; tarsi with rather broader dark annulations. Wings with the discal vein more bowed, the first posterior cell therefore wider in proportion at middle; postical vein not conspicuously darker than other veins.

Length 2.5–3 mm.

Another widely-distributed species.

Two more species of this group with black antennae (the third joint of which is longer than in the last two) are:—

T. carteri, n. sp., ♂ ♀. Resembling *annulata* and *coarctata*, but third antennal joint longer (as long as arista in male, barely as long in female), frons wider and vertical bristles closer together—hardly as wide apart as width

of frons opposite hind ocelli. Thorax densely dusted greyish, acrostichals bi- to tri-serial and dorsocentrals irregularly bi-serial. Abdomen with distinct dusted side-patches at base of each segment. Legs darkened in both sexes much as in *annulata*, front tibiae not so spindle-shaped as in *coarctata* and shorter-haired posteroventrally. The female differs from *praecincta* in having the sixth abdominal segment shining black and the seventh and eighth, together with the long slender terminal papillae, dusted greyish.

Length 3.75 mm. ♂, 3.25 mm. ♀.

A pair 'in coitu' taken by A. E. J. Carter at Callander (Perthshire) on June 7th, 1916.

T. praecincta, n. sp., ♂ ♀. Third antennal joint almost as long as arista, basal joints inclined to be reddish-brown. Legs yellow with annulated tarsi. Much resembling *strigifrons*, but abdomen with the basal margin at the sides of all segments dusted greyish, sixth segment in the female not shining black but dusted greyish like the seventh; the eighth shining; first five sternites shining.

Length 2.5-3 mm.

I know this species chiefly from the female, which has occurred in Surrey, Kent, Essex, Suffolk and Notts; but there is a male in the University Museum at Cambridge from the Old Philosophical Society's Collection.

(To be continued.)

ATHETA (CERITAXA Muls. and Rey) SPISSATA Muls. and Rey A VALID SPECIES AND AN ADDITION TO THE STAPHYLINID COLEOPTERA OF THE BRITISH LIST.

BY JAMES H. KEYS, F.E.S.

Mulsant and Rey (Aléochariens, 1873, p. 383) enumerate three species of *Ceritaxa*, viz. *C. testaceipes* Heer, *C. spissata* Muls. and Rey, and *C. dilaticornis* Kr.

On Plate III of the work cited, fig. 15, the eighth dorsal plate of the male of *testaceipes* is depicted, and fig. 16 of the same plate represents the corresponding tergite of *spissata*.

The male characters of *dilaticornis* are not illustrated. They are described (l.c. p. 392) as follows: '♂ L'avant-dernier segment de l'abdomen muni sur le milieu de son bord postérieur de deux petites saillies arrondies à leur pointe, presque semi-circulaires, et armé sur les côtés d'une dent à peine apparente située plus avant que les saillies précitées.'

'Une dent à peine apparente' is rather inexact, as the spine on each side is obvious when the plate is properly viewed.

On *spissata*, however, there is no trace of a spine. Mulsant and Rey (l.c. p. 393), in a note referring to it, say: 'Nous n'avons

jamais observé de dent sur les côtés du bord postérieur du sixième segment abdominal des ♂.

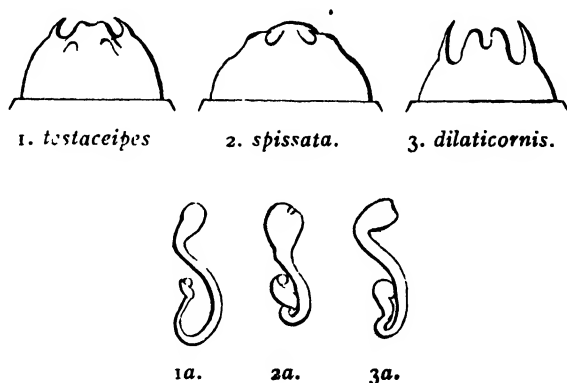
Later authorities have sunk *spissata* as a synonym of *dilaticornis*, and in describing the ♂ of the latter insect have mixed the features of both species, as the following extracts will show :—

Fauvel (Faune Gallo-Rhénane, T. iii, p. 709).—*Dilaticornis*. '♂ 7^e segment obtusément saillant du milieu, avec la saillie surmontée de chaque côté d'un tubercle oblique en forme de virgule creuse au milieu; en dehors une petite dent obsolete.'

But 'Obtusément saillant au milieu' is peculiar to *spissata*! In *dilaticornis* and in *testaceipes* this central portion is bilobed. The 'virgule creuse' effect may be obtained by suitable illumination, the tubercles being slightly concave. The 'petite dent' is proper to *dilaticornis*.

Ganglbauer (Die Käfer von Mitteleuropa. B. II, p. 191) apparently follows Fauvel: *Dilaticornis*.—'Beim ♂ das achte Dorsal segment in der Mitte in eine kurze, breit und flach abgerundete Lamelle ausgezogen.'

Reitter (Fauna Germanica. Die Käfer etc. B. II, p. 55) also similarly describes the lobe: 'in eine flach abgerundete Lamelle ausgezogen.'



A comparison of the illustrations here given, Nos. 1, 2 and 3, showing the differences in the form of the 8th tergite of the ♂ in the three insects under consideration, will, I think, make it manifest that *spissata* should be restored to specific rank; the spermatheca of the ♀ of the latter also differs from that of its allies, see figs. 1a (*testaceipes*), 2a (*spissata*), 3a (*dilaticornis*).

The examples of *A. spissata*, upon which these notes are founded, were captured in July, 1922, at Limpsfield, Surrey, in

fungus, by my friend Mr. Philip Harwood, to whom I am greatly indebted for several specimens of this interesting species. They agree with the description of *spissata* in Mulsant and Rey's work (*l.c.*) excepting in the degree of coloration. The beetles, having been obtained so early as July, are naturally more or less immature, and consequently their colours are not fully developed.

I desire to thank my friend Commander J. J. Walker, R.N., M.A., for kindly sending me his examples of *testaceipes* and *dilatatornis* for comparison, and also to express my acknowledgment of kind assistance to Col. J. Sainte-Claire Deville for confirming the determination of the *spissata*.

7 Whimble Street,
Plymouth.
May 1926.

BIOLOGICAL NOTES ON *EUSARCORIS MELANOCEPHALUS* F.
(HETEROPTERA).

BY W. E. CHINA, B.A.

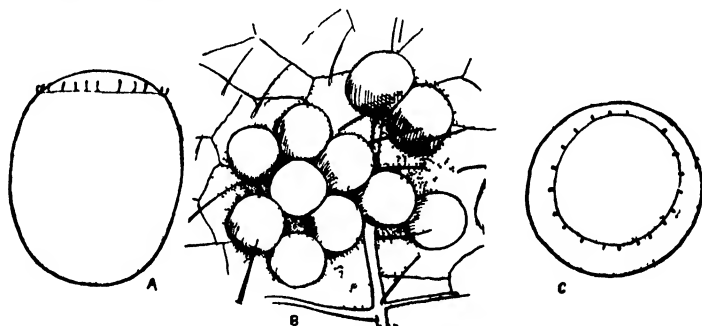
Although a gregarious insect, *Eusarcoris melanocephalus* F. is usually rare in this country and is normally taken only sporadically in various localities south of the Thames. As pointed out by Butler, however (*Biol. Brit. Het.*, p. 45), it periodically appears in large colonies in suitable localities on its food plant, *Stachys sylvatica*. The first record of its occurrence in considerable numbers was in May, 1877, when it was locally common at Hawkhurst, Kent. On June 6th, 1903—that is, twenty-six years later—Messrs. G. W. Kirkaldy and H. J. Turner (*Proc. S. Lond. Ent. Soc.* 1903, p. 11) took fifteen specimens on *Stachys* at Horsley, Surrey, including one pair 'in copula,' and in August of the same year Mr. Butler himself found a large colony of larvae on the usual food plant at Crookham, Hants. On exactly the same date, June 6th, 1926—that is, twenty-three years later—the present writer found the species in hundreds on a large clump of *Stachys* on the southern slopes of Box Hill, Surrey. Every flower-spike carried three or four pairs and dozens of others were crawling about over the leaves. Nearly all those seen were 'in copula' but there were some single specimens, and one female was noticed in the act of oviposition, having already laid eleven eggs in a cluster on the back of a leaf. Over sixty specimens were captured in a few minutes by picking them off the plants with the fingers, but hardly any impression seemed to be made in the numbers. A few were observed on the adjoining nettles. The sun was shining brilliantly

and the weather was hot, with scarcely any wind, but none were seen to fly; in fact their actions were rather sluggish. Since the egg does not appear to have been described, the following description is given:—

Egg of *Eusarcoris melanocephalus* F. (within one week of deposition). Length 0.92 mm., diameter at widest part 0.72 mm., diameter of the lid or cap 0.55 mm.

Of a uniform pale yellow, smooth and shining, more or less barrel-shaped, with the ends convex, but with the greatest diameter above the middle and the top slightly wider than the bottom. The delimitation of the lid feebly visible, but surrounded with nineteen or twenty slender, clubbed processes (micropyles) which are apically distinctly curved inwards over the edge of the cap. The usual Pentatomid T-shaped egg-opener is invisible at this stage.

Laid in small clusters of about a dozen, placed in more or less regular rows, on the undersides of leaves and on bracts of the inflorescence or *Stachys sylvatica* in early June.



Eusarcoris melanocephalus F.

A Egg from side, C. From above; B. Cluster of eggs on underside of leaf of *Stachys sylvatica*.

British Museum (Nat. Hist.),
Cromwell Road, London, S.W.7.
June 11th, 1926.

THREE NEW BRITISH APHIDES.

BY FRED. V. THEOBALD, M.A., F.E.S.

APHIS TRIGLOCHINIS, sp. nov.

Apterous viviparous ♀. Rich shiny green to shiny brownish-green; cornicles, cauda, antennae and most of legs dark. Antennal segment I larger than II; III longer than IV and a little longer than VI, with 25–28 sensoria over whole length, IV longer than V with 10–14 sensoria scattered over it; V with 3–6 small sensoria and the usual primary one; base of VI more than half the flagellum. Cornicles rather short and thick, strongly imbricated, cylindrical, somewhat expanding basally. Cauda about the length of cornicles and a little thicker; 3 hairs each side and 1 apical. Legs moderately long, with numerous hairs; most of tibiae deep green.

Length 1.3–1.7 mm.

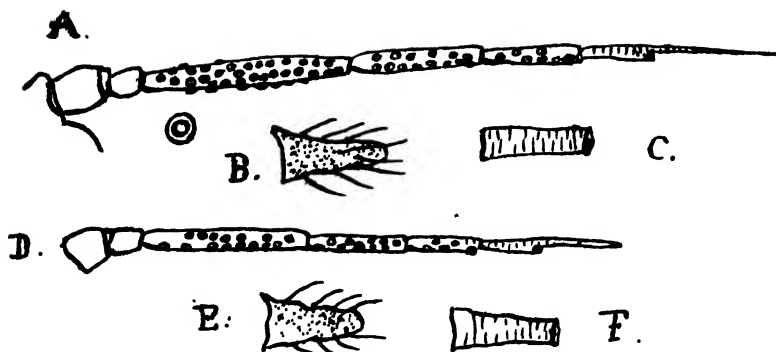


Fig. 1. *Aphis triglochinis*, sp. nov.

A. B. & C. Antenna, cauda and cornicle of alate ♀ ; D. E. & F. Of apterous ♀.

Alate viviparous ♀. Head and thorax black; abdomen rich deep shiny green, swollen. Antennae, cornicles and cauda black. Legs dark, except basal areas of tibiae. Abdomen with small lateral papillae. Antennae shorter than body; segment I larger than II; III longer than IV and about as long as VI; III with 36-45 sensoria all over it; IV with 16-18; V with 7-10+1; base of VI more than half the flagellum. Cornicles cylindrical, slightly broadening at bases, markedly imbricated, rather thick. Cauda thick, $\frac{3}{4}$ to more length of cornicles, 3 hairs each side and 2 apico-dorsal ones. Wings with pale yellowish-green veins.

Length 1.5-2 mm.

Food Plant. Sea Arrow-grass (*Triglochin maritimum*).

Locality. Seasalter, Kent. 2, VII, 25.

Observations. Great numbers found densely clustering up the seed heads of the Arrow-grass, on two plants only. Alatae, apterae, nymphae and larvae all closely packed together, but very few alatae. Both alatae and apterae have a very swollen, shiny appearance. A few apterae show no signs of antennal secondary sensoria, but are undoubtedly the same species. About ninety per cent. of the apterae were parasitised and the colonies died out.

ANURAPHIS PRUNIFEX, sp. nov.

Apterous viviparous ♀. Black, deep blackish-green or yellow-green with black transverse bars on abdomen and the dark lateral spots, these vary so much that the whole insect becomes dark; very shiny. Antennae less than $\frac{1}{2}$ length of body, base pale, apices dusky. Cornicles short, black. Anal plate and cauda small, hidden under abdomen, dark. Legs green, apices of fore tibiae and most of mid and hind pairs dark; tarsi dark. Antennal segment I dark, larger than II, which is pale; III nearly twice as long as IV; IV a little longer than V; IV-VI dark; base of VI a little shorter than V, flagellum about 4 times as long as base. Rostrum reaching to 3rd coxae; green, apex dark. Cornicles short, thick, bases expanded, about as long as last hind tarsal. Anal plate flat, broadly rounded at apex, with many long hairs. Cauda small, rounded apically. Spiracles with a black area around them. A few short hairs on body. Legs moderately long and thick, a few hairs at apices of femora

and many short ones on tibiae. In some specimens the apex of antennal segment III is dark.

Length 1.5-2 mm.

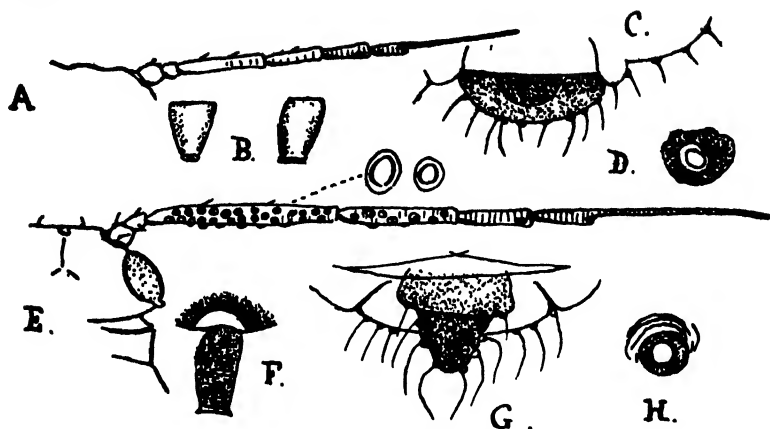


Fig. 2. *Anuraphis prunifex*, sp. nov.

A.-D. Apterous viviparous ♀; E.-H. Alate ♀.

A. and E. Head and antenna; B. and F. Cornicles; C. and G. Cauda and anal plate; D. and H. Spiracles.

Alate viviparous ♀. Head, thorax, cauda, anal plate and cornicles black; abdomen deep brownish-green to almost black, very shiny, with dark lateral marks; venter pale brownish-green, black at apex. Legs pale greyish-brown; apices of femora, tibiae and the tarsi black. Antennae nearly as long as body; segment I wider than II, but no longer; III much longer than IV, but not so long as VI, with 28-32 sensoria; IV with 9-12; V shorter than IV; basal area of VI about $\frac{2}{3}$ of V; flagellum moderately long. Rostrum narrow, reaching to 2nd coxae. Cauda about as long as cornicles, nearly twice as wide at base; 3 hairs one side, 2 the other; slightly projecting from abdomen. The short, jet-black cornicles are cylindrical, constricted one side at base; shorter than last hind tarsal. Wing insertions pale; stigma grey; veins grey to pale brownish-green. Base of cornicles may be pallid. A few hairs on body.

Length 1.5 mm.

Food Plant. *Prunus spinosa*.

Locality. Romney Marsh, Kent. 19, VI, 14.

Observations. This insect occurred in great numbers on some isolated dwarf *Prunus spinosa* growing out on the shingle on Romney Marsh, near the sea. It caused the leaves to curl tightly up and to become pale in colour, some pale green, other yellow, others with a bright pink tinge. When I took them they were all apterae, but a colony brought away soon became nymphae, and alatae hatched out first on June 24th and went on doing so until July 7th. The variation in colour of the apterae was very marked, some being jet black, others with traces of linear deep green bands and a median line, others in which the black showed only as

broad median transverse bars and dark lateral spots similar to those in the deep rusty red *A. insititiae* of Koch.

ANURAPHIS SHERARDIAE, sp. nov.

Apterous viviparous ♀. Pallid green, some almost transparent; apex of antennae, rostrum and the tarsi dusky. Eyes reddish-black. Antennae a little more than half the length of body; segment I wider, but no longer than II; III a little longer than IV; IV a little longer than V; base of VI as long as V; the flagellum about three times as long as base. Rostrum reaching to or about 3rd coxae. Cornicles small, almost conical, about as long as segment V of antennae, very broad at base. Cauda swollen, stumpy and a little shorter

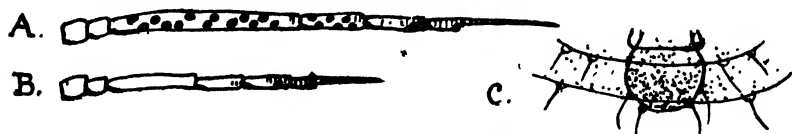


Fig. 3. *Anuraphis sherardiae*, sp. nov.

A. Antenna of alate ♀; B. Of apterous ♀; C. Cauda and anal plate

than cornicles, with some long hairs, finely spinose. Anal plate broader than cauda. Apex of abdomen with some long hairs. Legs rather short and moderately thick.

Length 0.8-0.9 mm.

Alate viviparous ♀. Green; head and thorax dark; antennae, cornicles and cauda dusky; legs same colour as body; apices of tibiae and the tarsi dark; rostrum dark at apex. Wings with one fork-cell. Antennae shorter than body, segments I and II about equal; III much longer than IV, with several sensoria; IV longer than V, with several sensoria; base of VI nearly as long as V, the flagellum three times as long. Cornicles short, not quite so long as segment V of antennae, wide, cylindrical, narrowed towards apex. Cauda about same length as cornicles.

Length 1 mm.

Food Plant. Field Madder (*Sherardia arvensis*).

Locality. Prestatyn, N. Wales. VII, 23 (A. A. Dallman).

Observations. A very minute and delicate species, almost impossible to pick off the plant. Described from numerous apterae and one or two nymphae and a single damaged alate female found by Mr. Dallman.

Wye Court, Wye.

May 1926.

COLEOPTERA, SAWFLIES AND TIPULIDAE DROWNED IN THE SEA.

BY HUGH SCOTT, M.A., SC.D.

The notes by Commander Walker and myself in the May 'Entomologist's Monthly Magazine' (1926, pp. 115, 116) under the heading 'Coleoptera and other insects in the sea,' have elicited from Mr. J. V. Pearman, of Bristol, the interesting information

which follows, and which he has kindly asked me to publish. For this purpose I have arranged certain extracts from two of his letters.

'In June, 1920, at Brean, in Somerset, I found a considerable number of beetles strewn along the high tide line on the beach. There is nearly always a strong breeze there, mostly inland from the water, but on this occasion there had been a few days of calm, with great heat. Nearly all the insects were in bad condition through being churned up with sand by the incoming tide; all were common, but, curiously, all were 'pretty' species. I got undamaged specimens of *Silpha quadripunctata*, *Corymbites pectinicornis* and *C. cupreus*, and *Staphylinus caesareus*. There must have been many other Coleoptera, but I did not take any note of the damaged species. The only other noticeable insect was a largish green and yellow ringed sawfly, which was very numerous. Obviously the insects had been tempted to flight by the hot weather, drifted seawards on upper air currents, and had either dropped or been blown into the water. There must have been hundreds along the tide line, but I did not find any of the beach insects common to the district among them.'

In his second letter, however, Mr. Pearman put forward another possible explanation: 'I think my explanation of what must have happened is the most feasible, namely that the prevailing hot and comparatively calm weather at that period had tempted the insects to flight, and that after drifting seawards they had been blown, or had dropped, into the water. I have noticed at other times that flying insects there exhibited a tendency to fly seawards, and I have found most unlikely species settled far out on the bare sand. Of course, there is an alternative suggestion. The nearest part of the Glamorgan coast is only a little over twelve miles distant to the N.W., and the insects may have originated from that district; but, knowing the wealth of insect species on the sandhills, I incline to the view that they were natives of Brean.* The fringe of dead insects was about half a mile long, and varied in width from one inch at the ends to about three inches in the centre. It consisted mainly of Coleoptera, and, apart from the sawfly, the only representatives of other Orders were a few Diptera and one badly battered moth.'

For the sake of those who do not know the locality, it may be well to add Mr. Pearman's description of the place where these observations were made: 'Brean lies midway between Weston-

* The two *Corymbites* mentioned are always found in hilly or mountainous regions and must have come across from Wales.—G.C.C.

super-Mare and Burnham on Sea, on the Bristol Channel, with an "uninterrupted view" across the Atlantic to Newfoundland. On the north Brean Down, an isolated offshoot from the Mendip Hills, juts out into the sea. From the Down the shore extends southwards in a gentle curve for about seven miles, to the mouth of the River Parret. Except at the foot of the Down the whole stretch is entirely sandy and nearly flat. At the lowest tides one can walk seawards for nearly half a mile, and can go about half that distance before encountering mud. The hinterland is flat, scarcely above sea level, for many miles, and once formed part of an immense marsh in which stood the Isle of Athelney. As a protection against the inroads of the sea, the monks of Glastonbury built a wall of clay, with a stone core, a few yards above high water mark, for nearly the whole seven miles. The fury of the wind piled sand over this wall, and there is now a long fringe of sand dunes bordering the beach. The strength and constancy of the Atlantic breezes are remarkable, and great quantities of sand are sometimes flung right over the sand hills on to the coast road. What few trees there are have all taken a strong bend landwards. The sandhills support a rich and varied insect life, but entomologically its day is over, and I fear it will not be possible to repeat the observation, for since the end of the war the place, once almost inaccessible, has been "discovered" by the worst type of motorist, and in fine weather it is over-run by people to whom the simple natural charms do not appeal.'

I am tempted to add here some observations of my own on a great swarm of a common species of *Tipula*, and the destruction of the insects by their being blown into water. This swarm made a considerable impression on me, and the following particulars are extracted from my natural history journal of nearly twenty-four years ago. At the time I believed the species of *Tipula* to be *T. oleracea*, and I am nearly sure that this was so, though no specimens have been preserved until now. The swarm occurred at Southwold, Suffolk, in September, 1902. It was first noticed at the time of my arrival, about September 4th, and from then till the 11th it consisted almost entirely of females, though during the last few days of that period a few males were appearing. On the 11th I noted that the females were being drowned in dozens in the dykes which intersect the marshy land about the River Blyth, and on the 15th there was a fringe of the drowned insects along the edge of the waves on the coast, almost all being females. On that same day (15th) I also wrote that numbers of the females were

still being drowned in the dykes, where some of them were clinging together in masses; by that date males were swarming but were 'not dying much.' On the 16th 'nearly all the female *Tipula* seem to be drowned, but great numbers of males are about,' the latter flying, when disturbed, from gorse-bushes in such numbers as to produce quite a loud buzzing. Pairing was noticed at the time when the swarm of males appeared and when the great abundance of females was almost over, and while the latter were being killed in hundreds, 'almost all by being blown into the water.' Consequently the number of pairing couples was very small compared to the total numbers of the swarm, which were very great. Although the greatest numbers of females and males hardly overlapped, yet there were, throughout the duration of the female swarming, a few males, and conversely a few females survived till the male swarm was at its height. I did not remain in the district long enough to see whether the males afterwards shared the watery fate of the females.

A final remark: at the time of writing this note I have just had the privilege of hearing in Cambridge a series of lectures by Dr. R. J. Tillyard on fossil insects and other matters. It is not unnatural to reflect that some of the insects of long past epochs, which have left their impressions so plentifully in the rocks in certain parts of the world, may have been overwhelmed in the same manner as those discussed above. Were such insects as those found by Mr. Pearman at Brean to be thrown high and dry by an exceptionally high tide, and then buried under blown sand, or were they to be otherwise engulfed in sand or mud, might this not be the beginning of a long process which would transform them into one of the fossil beds of future ages?

[Since this paper has been in type, the following facts have come to hand. Mr. H. T. Pagden, of Christ's College, Cambridge, has told me that, while sailing off Dawlish, South Devon, one day in August, 1920, he noticed great numbers of a large Pentatomid bug† flying out to sea and falling into the water; this was about two miles from the shore, but the bugs were still seen, though in decreasing numbers, to about four miles. Specimens of *Bombus terrestris* and *Bombus lapidarius* were observed falling into the sea at the same time, but these were few compared with the numbers of the Pentatomid. The time was late afternoon or early evening, weather very fine, with a light off-shore wind. My attention has also been drawn to a note by W. C. Hewitson in the

† Probably *Piezodorus lituratus* F.—Eps.

'Entomologist,' vol. xi, pp. 175-176, on the capture by fishermen of living examples of *Calosoma sycophanta* in the sea between thirty and forty miles from the coast.]

Museum of Zoology,
Cambridge.

May 21st, 1926.

Diplocoelus fagi Chev., *Enicmus brevicornis* Mann., etc., in the Oxford District.—On May 22nd I found a few specimens of these two local and uncommon beetles in a couple of small dead beech trees standing about a mile from Cothill, Berks, both these insects being unexpected and welcome additions to the local list of Coleoptera. A visit to the trees yesterday produced the *Diplocoelus* in considerable numbers, hiding under dry lichen and small loose flakes of bark; but as on the previous occasion, the *Enicmus* was very scarce and hard to find. *Dacne humeralis* F., *Litargus bifasciatus* F., *Melasis buprestoides* L., *Hedobia imperialis* L., *Cis pygmaeus* Marsh., *Abdera ququadrifasciata* Curt., *Rhinosimus ruficollis* L., *Xyleborus saxeseni* Ratz. and *Cryphalus fagi* F. were also present in the trees in varying numbers, the last-mentioned being also new to the Oxford District. It may be noted that *D. fagi* and *E. brevicornis* have been recorded by Dr. N. H. Joy (E.M.M., XXXIX, pp. 98, 297) from Streatley, Berks, where I have taken the first-named in plenty in old beech faggots.—JAMES J. WALKER, Oxford: June 22nd, 1926.

A Meadow-Brown Butterfly (Epinephle jurtina L.) with abnormal white patches on all four wings.—Several months ago, Mr. J. P. Stacey of Chatham showed me a specimen of this common butterfly caught by him on August 3rd, 1924 (temporarily in my possession) at Bredhurst, Kent, in which there is a large area of white on each of the two right wings, reaching to their edges; but on the left wings they do not extend as far, there being a well-marked edging of the normal brown colour external to the pale areas on both fore- and hind-wings. This was a wild-caught specimen, not bred; and the white blotches are presumably due to accident during the pupa stage. While such abnormalities not rarely occur, the present one may be worth recording for locality.—FREDERICK L. WELCH, M.R.C.S., Hartley, Nr. Longfield, Kent: June 5th, 1926.

Echthromorpha intricatoria F. in New Zealand.—Under the above heading in the February (1926) number of this Magazine (page 40) there appears an article by Mr. G. V. Hudson, of Wellington, New Zealand, relative to the occurrence of the Ichneumon-fly *Echthromorpha intricatoria* Fab. in New Zealand, from which it would appear that Mr. Hudson has not obtained information as to the experience of the various entomologists of the country. His locally-gleaned knowledge in no wise represents a census of the known occurrences of this species.

Prior to reading Mr. Hudson's article, the writer had the privilege of examining many private collections in which examples of *Echthromorpha intricatoria* were present, and, furthermore, specimens had been forwarded to him from time to time. In order to bring the records of the Ichneumon up to date, I communicated with the majority of the entomologists of the Dominion and the following are the results derived from the enquiry:—

Cawthron Institute, Nelson.—A collection consisting of 73 individuals, taken by Mr. A. Philpott, Mr. W. Heighway and the writer. They are mainly local

specimens, and have been captured during a period extending over the last six years. In Nelson the insect is common, and it is the opinion of the writer that the district was more or less neglected until the inception of the Institute paved the way for local entomological research. Included in this number are three males presented by Mr. Philpott, one from Tisbury, South Island (March 1st, 1917), one from Sandhill Point, Invercargill (January 1st, 1917), and one from New River, Invercargill (February 20th, 1916); also a large female from Mr. J. J. Waigh, Roxburgh (March 24th, 1926).

Mr. J. J. S. Cornes, Christchurch.—Mr. Cornes' records are so important that I think it advisable to quote directly from his letter on the subject: 'I have not the exact dates of my *Echthromorpha* specimens, but pretty nearly. In September, 1924, I collected about 300 pupae of *Nyctemera annulata* at Governor's Bay, and obtained 29 parasites. At the end of February, 1925, I first got pupae of *Vanessa gonerilla* and *Vanessa itea*, parasitised, but in great numbers. In a small patch of nettle at the top of the Heathcote Valley, I took about 200 pupae, and from these I must have had nearly 100 parasites, of which I mounted 37. This year I could find no caterpillars or pupae at this spot but did not try Governor's Bay. "Red Admirals" were scarce this spring.*

Mr. C. E. Clarke, Dunedin.—Six examples, as follows: Waitati, June 21st, 1917; Opoho, Dunedin, November 12th, 1917 (2); Dunedin, November 17th, 1917 (2); and Dunedin, October 14th, 1920.

Mr. Clarke writes: 'I bred the two Opoho specimens from larva of *Oeceticus omnivorus*, and on another occasion one emerged, in January, I think, much to my regret, from a pinned pupa of *P. gonerilla* which I had put among my season's collecting, waiting to be sorted.'

Mr. F. J. Tapley, Governor's Bay, Canterbury.—Four *Echthromorpha*: Mount Grey, February 24th, 1924 (3), 'taken hovering around a clump of *Senecio*, evidently parasitising the larvae of *N. annulata*. *E. intricatoria* was very plentiful at Mt. Grey where my specimens were taken.' The other example was given to Mr. Tapley by the writer.

Mr. C. C. Fenwick, Dunedin.—Four Ichneumons, taken as follows: Longwood Range (near Irepuki), January 2nd, 1915; Sandhill Point (on the way to Preservation Inlet), January 1st, 1917; Paradise, January 1st, 1917, and Alexandra, March 20th, 1919.

Canterbury Museum, Christchurch.—Specimens from Mt. Grey (secured by Mr. S. Lindsay), April 14th, 1917, and Christchurch, March, 1925.

Mr. J. W. Campbell, New Brighton, Christchurch.—Two records, Mount Grey, February 23rd, 1924, and Blackball (West Coast of the South Island), January, 1925.

Mr. S. Lindsay, Christchurch.—One example from Mt. Grey, February 24th, 1924.

Biological Laboratory (Department of Agriculture), Wellington.—Two females and one male presented by the writer.

I have myself acquired the following example: Many taken locally at Nelson, September 1923—April 1926, and one from Otira, February 1920. In addition there are a number sent by the following entomologists:

Mr. G. Howes, Dunedin.—Five specimens: Waitati, December 10th, 1916; St. Clair, Dunedin, April 1st, 1919 (stated to be reared from larva of *Vanessa gonerilla*); Woodhaugh, Dunedin, December 28th, 1919, and McAndrews, March 1st, 1922 (2).

* The 'Red Admiral' (*Pyrausta gonerilla*), referred to in this paper is the New Zealand, and not the English butterfly (*P. atalanta*) of the same popular name.

Mr. H. Turner, Christchurch.—A microscopic slide of a large female, secured at Mt. Grey in November 1917.

Mr. H. W. Hende, Westland.—One example, Hende's Ferry, November 1919.

Mr. T. R. Harris, Ohakune.—Mr. Harris obtained the Ichneumon either on the West Coast of the South Island or at Stewart Island in March 1926; he has seen others at Greymouth.

Mr. S. Lindsay, Christchurch.—One Ichneumon, Mt. Grey, February 24th, 1924.

Mr. J. F. Tapley, Governor's Bay, Canterbury.—Mt. Grey, February 24th, 1924 (1).

Mr. H. Crowe, Governor's Bay, Canterbury.—One specimen reared from *Nyctemera annulata* on May 12th, 1922.

Mr. J. R. Manhire, Governor's Bay, Canterbury.—A single example reared from *Oeceticus omnivorus* in April 1922.

At the date of completing this article (April 27th) I collected 26 *Echthromorpha* in an hour and a half, proving that even at this late period of the year the Ichneumon is common. One female was observed in the act of parasitising a pupa of the native moth, *Mecyna maorialis*.

At Nelson, in 1924, many examples of *E. intricatoria* were reared from pupae of this moth. Fully sixty per cent. were parasitised.

It is a matter for concern that this Ichneumon-fly is attacking two of our most prominent native butterflies, and also two harmless native moths. On the other hand, its parasitism of *N. annulata* is desirable from the point of view of growers of certain classes of Compositae.

E. intricatoria is a sun-loving insect, delighting in flying among glabrous-leaved shrubs. It is difficult to net this Ichneumon after the insect has settled, owing to its habit of clinging tightly to the plant, so that it becomes necessary at the same time to sweep off the twig on which it rests. When flying, in its comparatively slow manner, it may easily be caught, and one has only to wait in the vicinity of a well-sheltered laurel hedge in the sun to secure large numbers. Ivy in flower is also a favourite haunt.

From the foregoing records it appears that the first New Zealand example known is that taken in January 1915, on the Longwood Range; this specimen is at present in the collection of Mr. C. C. Fenwick.—E. S. GOURLAY, Cawthron Institute, New Zealand: April 27th, 1926.

Review.

'THE PLANT-LICE OR APHIDIDAE OF GREAT BRITAIN,' Vol. I, pp. ix and 372, with 196 text illustrations, by FRED. V. THEOBALD. Headley Bros., Ashford and London: price 25/-.

This publication is described by the author as a collective monograph of the British Aphides, exclusive of the Phylloxeridae (*Phylloxera* and *Chermes* in the broad sense). It deals with all the forms so far found in Britain, and includes such of Walker's species that are recognisable. Keys are given for the sub-families, tribes, sub-tribes, genera and species, and the classification is based upon that recently put forward by Baker for the N. American representatives of the family. Each species is fully described, and figures of structural details of most of them are appended. Since the publication of Buckton's Monograph (4 vols., 1875-1884) only scattered articles on the British species have appeared in our literature. The present volume, therefore, brings the subject up to date, and it will be welcomed by all students of these destructive pests, as well as by fruit farmers and horticulturists.

OBSERVATIONS ON BRITISH COCCIDAE. X.

BY E. ERNEST GREEN, F.E.S., F.Z.S.

• *Icerya purchasi* Mask.

Early in January, 1925, I received from Mr. A. Roebuck several living adult females and numerous young nymphs of *I. purchasi*. I had previously seen dried examples only of the species, and scarcely recognised these brightly coloured insects as being of the same species. Living specimens have a medio-dorsal series of stout yellowish-white waxy processes with dorso-lateral and marginal tassels of a similar nature, intermingled with longish glassy filaments. The exposed areas of the body are of a reddish colour, more or less obscured by grayish-white granular secretion. A stout, white fluted ovisac extends from behind the body.

The young insects are red, with a marginal series of short, yellowish, waxy tassels, the dorsum with hummocky masses of similar secretion.

The insects occurred on the foliage of *Pittosporum* plants which were said to have been imported from France two years previously.

This notorious insect has not previously been recorded from the British Isles. If unchecked, it might well become a serious pest in our plant houses, though it is improbable that it could survive a winter in the open. I understand that the infested plants have now been destroyed.

Matsucoccus pini Green.

Kuwania pini Green (Ent. Mo. Mag., February, 1925, p. 34).

Mr. H. Morrison (in litt.) draws my attention to the fact that this insect is referable to the genus *Matsucoccus*, erected—by Cockerell—to contain the single species *matsumurae*, of Kuwana. Our British species appears to differ from *matsumurae* in the number and character of the antennal joints.

Phenacoccus nudus n. sp. (Fig. 1.)

Adult female elongate ovate, narrow, rounded in front and behind, without prominent paranal lobes. Colour of living examples pale orange-yellow, very lightly dusted with white powdery secretion. Without waxy tassels. Length 2.25–3.75 mm. Breadth 1–1.25 mm. Antennae (c) 9-jointed; 2nd and 9th joints longest, approximately equal. In the example figured the 3rd joint is narrowed distally; but this is not invariably the case, this joint often being cylindrical. Eyes moderately conspicuous; prominent. Labium (d) triangular; moderately stout, the breadth (at base) equalling the length. Rostral loop very short; equal to about half the length of the labium. Legs (a) well developed, robust; tarsus more than half the length of the tibia. Claw (b) slender; with a small denticle near the distal extremity. Ungual digitules very inconspicuous, slender, very slightly dilated at extremity. Tarsal digitules slender, simple. Coxa or hind

limbs without conspicuous translucent pores. The six anal setae are shorter than the caudal pair (see *e*). Dorsal and ventral ostioles obsolete or obscure. Cerarii obscure. There is a small aggregation of minute quinquelocular pores on the ultimate segment, around the base of the caudal setae, accompanied by four or five auxiliary trichiform setae, with a simple minute spiniform seta. Other smaller aggregations of similar pores occur on the lateral areas of the penultimate and antepenultimate segments, with (occasionally) one or two minute spiniform setae. Nothing of the nature of cerarii can be observed on any other segment of the body, though a few isolated, extremely minute, spiniform setae occur, at long intervals, along the margin. The micropores (*f*)—in this species—are uniformly quinquelocular and are distributed sparsely over the whole body, but more closely on the frons. Mingled with these are some slightly larger discoid pores (*g*). There are a few trichiform setae on the frons, but not elsewhere.

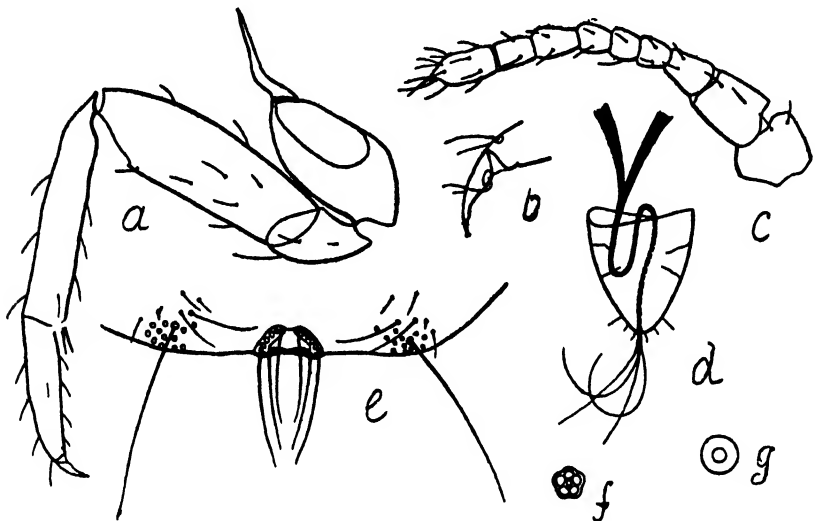


Fig. 1. *Phenacoccus nudus*. (a) 3rd leg, $\times 220$. (b) Claw, $\times 450$. (c) Antenna, $\times 220$. (d) Labium, $\times 220$. (e) Posterior extremity, $\times 135$. (f) Quinquelocular pore, $\times 840$. (g) Discoid pore, $\times 840$.

On grasses, beneath the ensheathing bases of the leaves. Camberley. June.

The species appears to be peculiar in the possession of quinquelocular (in place of the usual obscurely trilocular) micropores.

Genus *RHIZOECUS* Künckel.

'Ann. Soc. Ent. Fr.' (5), viii, p. 163, 1878.

This genus was established to contain the single species *falcifer*. Künckel defines his genus as follows: 'Body elongate, margins of 2nd, 3rd, 4th, 5th, 6th and 7th segments almost parallel; on the last segment are situated two large tubercles with excessively long hairs in comparison with those on the remainder of the body. Antennae 5-jointed in both the immature and adult female: 1st

and 3rd of equal length, 2nd very short, 4th shorter than 3rd, 5th almost as long as the previous four (together); the terminal joint bears—in addition to the ordinary fine hairs—some other characteristic sickle-shaped hairs. No vestige of eyes. Legs relatively long; tarsus without inflated hairs (digitules); claws with a short spine at the base—the rudiment of a second claw.'

Though Künckel's definition would exclude species with more than 5-jointed antennae, I consider that it should be extended to permit of the inclusion of the clearly congeneric species—*halophila* Hardy, and of the new species (*elongatus* and *dianthi*) described below, all of which have 6-jointed antennae. So extended, I believe that *Rhizoecus* will form a clearly defined genus, readily separable from *Rippersia* by the following characters:—

Form usually elongate, with or without prominent paranal lobes. Antennae geniculate, with bases more or less approximated, the apical joint always with several stout falciform setae. Without any trace of vestigial eyes. Labium elongate, slender. Without cerarii or calcariform setae. Anal ring with concentric series of large irregular cells (see Fig. 2-d).

In contradistinction, the genus *Rippersia* might be characterised as follows:—

Form usually broadly ovate, without prominent paranal lobes. Antennae not geniculate, their bases respectively distant, without falciform setae on the apical joint. With more or less well defined vestigial eyes. Labium usually short and broad. Usually with one or two pairs of cerarii bearing calcariform setae. Anal ring of the beaded type found in *Pseudococcus* and its near allies.

(NOTE.—Typical *Rippersia* appears to have a closer affinity with *Trionymus* than with *Rhizoecus*, while *Geococcus* is clearly allied to *Rhizoecus*.)

Rhizoecus elongatus n. sp. (Fig. 2.)

Form elongate, narrow; the posterior extremity (a) evenly rounded, without prominent paranal lobes; length exceeding twice the breadth; average dimensions 1.9 by 0.7 mm. Antennae (c, d) geniculate; their bases separated by a space approximately equal to the length of the apical joint; 6-jointed, setose, the apical joint with three stout falciform setae. Labium (b) elongate and pointed; its length approximately equalling twice its breadth at base. Limbs (e, f) well developed, moderately robust; the tarsi broad at base and tapering evenly to the slender claw. Both the antennae and limbs, of fully adult examples, vary considerably in size (cf. c with d, and e with f), the difference not necessarily corresponding with the relative sizes of the bodies of the insects.

the larger limbs being often associated with the smaller individuals. Body setae short and sparse; with three longer and stouter setae on each side of the terminal segment. Dorsal ostioles obsolete or obscure. A single minute (but sharply defined) circular medio-ventral ostiole. Without discoid or specialised trilobate pores; but with numerous obscurely trilocular micropores. Anal ring (d) with a treble series of relatively large, irregularly shaped, sharply defined areoles, the innermost series denser than the other two; with six moderately stout, longish setae.

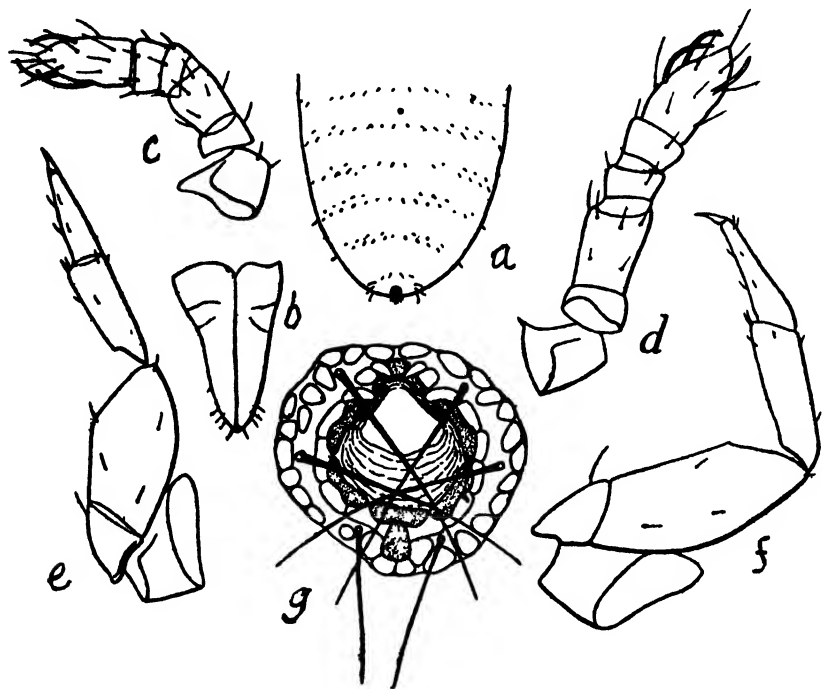


Fig. 2. *Rhizoecus elongatus*. (a) Abdomen of adult female, $\times 30$. (b) Labium, $\times 220$. (c, d) 1st leg (showing variation in size), $\times 220$. (e, f) Antennae, $\times 220$. (g) Anal ring, $\times 450$.

On the roots of a species of *Phyllocactus*, Bournemouth, January. Submitted by Mr. G. Fox-Wilson.

Nearly related to *R. halophila*, from which it may be distinguished by the very much smaller body setae and by the complete absence of discoid pores. The present species occurs on the roots of cultivated plants, under glass; while the usual habitat of *halophila* is under stones in arid grass land.

Rhizoecus dianthi n. sp. (Fig. 3.)

Adult female elongate-ovate; broadest across the meso- and metathorax; rounded posteriorly (e), without prominent paranal lobes; body and limbs not conspicuously setose. Length 1.75-2 mm. Breadth 0.75-1.15 mm. Antenna

(a) 6-jointed; 3rd and 6th equal, longest; the apical joint (b) as long as the combined 4th and 5th, with three stout falcate setae. Labium elongate, its length less than twice its breadth at base. Legs (d) well developed, but relatively small; not extending beyond the margin of the body; claws long and slender; tarsus and tibiae of equal length; the second and third limbs with two strongly developed spiniform setae on the inner edge of the tarsus, and one near the distal extremity of the tibia. Anal ring very slightly recessed, with six setae. Anterior and posterior dorsal ostioles conspicuous; with thickened rims. No medio-ventral ostiole. Micropores of the usual form, numerous but not crowded. Discoid pores sparse; confined to the last two segments of the abdomen. Specialized trilobate pores (c) relatively small, few, two on the terminal segment, and from three to five on each of the other segments of thorax and abdomen. Body setae small and sparse; margins of abdominal segments each with one or two longer setae; with three longer and stouter (caudal) setae on each side of the ultimate segment.

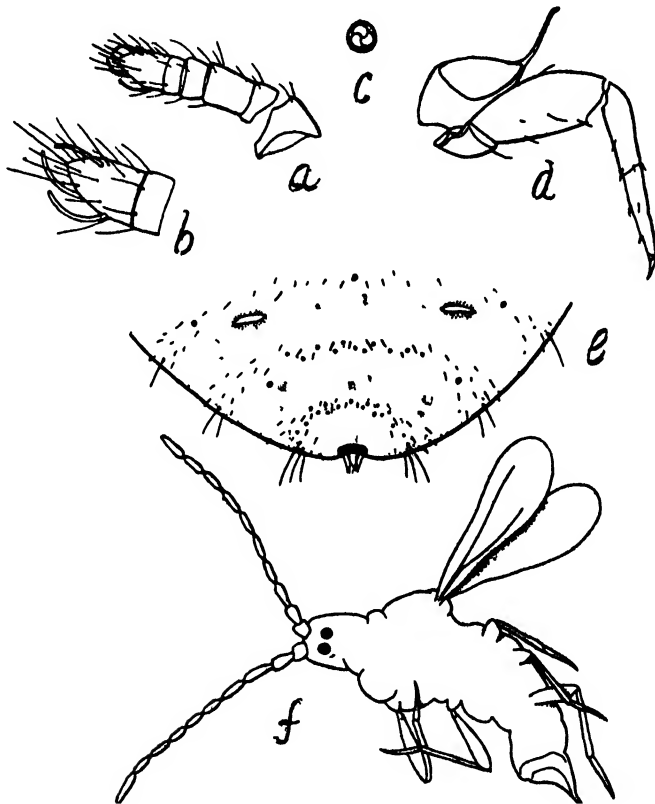


Fig. 3. *Rhizoecus dianthi*. (a) Antenna, $\times 135$. (b) Terminal joints of antenna, $\times 220$. (c) Trilobate pore, $\times 450$. (d) 3rd leg, $\times 135$. (e) Posterior extremity of body, $\times 80$. (f) Adult male, $\times 65$.

On the roots of *Dianthus plumarius* and *D. barbatus*: Royal Horticultural Society's Gardens, Wisley, December. Submitted by Mr. Fox-Wilson.

I have also received the same species from Miss W. H. Saunders, on the roots of *Chlorophytum* sp. Miss Saunders informs me that she has taken this species 'on the roots of many kinds of cool greenhouse pot plants,' including *Dracaena stricta*, *Fuchsia*, *Eryngium bromeliaefolium*, *Pelargonium quercifolia* and *Aspidistra lurida*.

The same observer has allowed me to examine an uncleared mount of a male that was found 'in the soil from a pot in which a plant infested with *Ripersia* (*Rhizoecus*) *dianthi* was growing.' I have no hesitation in placing this as the male of *R. dianthi*. The preparation, being uncleared, is more or less opaque, and little more than the outline of the insect can be distinguished. As, however, no males of *Rhizoecus* (or even of any *Ripersia*) have been described or recorded, the accompanying imperfect figure (*f*) may be useful, as showing the general form of the male. It will be observed that the wings are very small and could hardly be employed in flight. Otherwise the characters (so far as they can be seen) are typically Pseudococcine. This little male is less than a millimetre in length.

Rhizoecus decoratus n. sp. (Fig 4.)

Adult female (*a*) elongate, narrow, parallel-sided; terminating posteriorly in two broadly conical paranal lobes. Body and limbs conspicuously setose. Margins of abdominal segments tumescent. Length 2.5-2.75 mm. Breadth across middle 0.5-0.75 mm. Antenna (*b*) geniculate, 5-jointed; 5th joint (*c*) wider than the preceding joints and longer than the 2nd, 3rd and 4th together; all the joints longly setose and, on the 5th, with from four to five stout falcate setae. Labium elongate, obscurely dimerous; length approximately twice the width at base. Legs (*d*) relatively large and stout, extending beyond the margins of the body; claw long and slender; tarsus approximately three-quarters length of tibia; tibia and tarsus together as long as the combined femur and trochanter; tarsi of first and third limbs each with a single, strongly developed, spiniform seta towards the middle of the inner edge; tarsus of second limb with two similar setae—at half and three-quarters distance from the base; tibiae of second and third limbs each with a single spiniform seta—near the distal extremity. Anal ring with six setae. Anterior and posterior dorsal ostioles rendered conspicuous by heavily chitinated rims. No medio-dorsal ostioles. Micropores of the usual, obscurely trilobular, form; closely distributed over both dorsum and venter. Discoid pores (*f*) numerous, crowded on the venter and the last two abdominal segments, in transverse series encircling each of the remaining abdominal segments, and distributed over both surfaces of the cephalothorax. There are, in addition, many large and conspicuous trilobate pores (*e*), the lobules of which do not lie in the same plane, but are inclined and contorted—like the blades of a propeller—and project above the surface of the derm. These specialized pores are distributed over both surfaces of the body, more particularly on the marginal area of the cephalothorax and in transverse series encircling the abdominal segments, the series

numbering from 12 to 15 pores on each of the basal segments, from 20 to 24 on each of the mesal segments, with 2 only on the terminal segment. Paranal lobes each bearing a tuft of six very long and many short setae; with similar longer and shorter setae on the margins of each segment of the body.

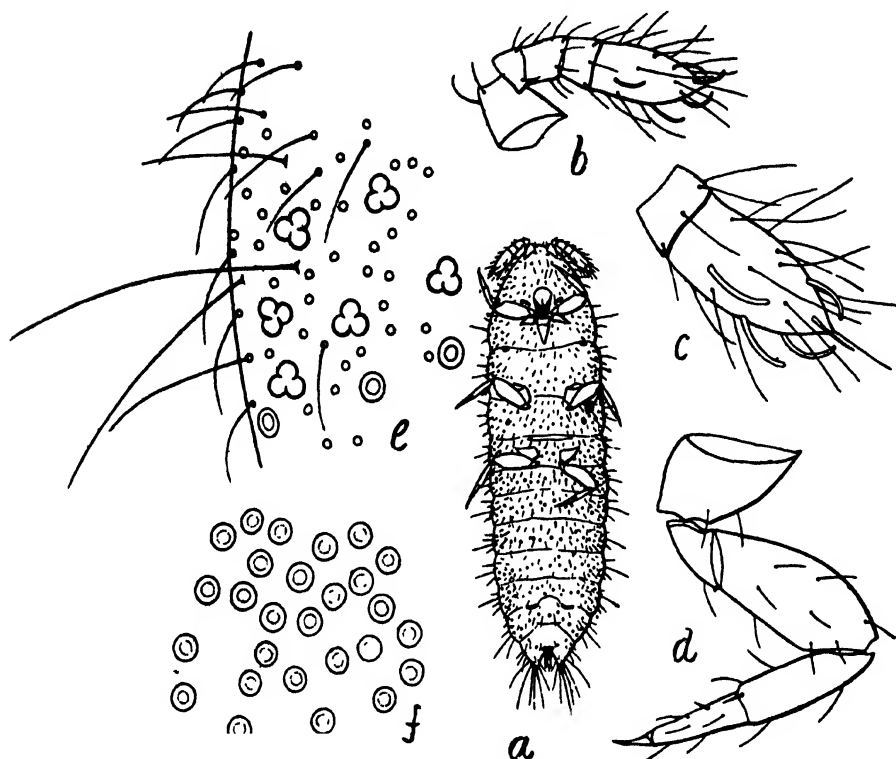


Fig. 4. *Rhizoecus decoratus*. (a) Adult female, $\times 30$. (b) Antenna, $\times 135$. (c) Terminal joints of antenna, $\times 220$. (d) 3rd leg, $\times 135$. (e) Marginal area of mid-abdomen, $\times 450$. (f) Discoid pores from last segment of abdomen, $\times 450$.

The pre-adult (late nymphal) stage differs from the adult in the reduction of the paranal lobes—which are scarcely prominent; in the smaller number of the large trilobate pores—of which there are transverse series of from 5 to 8 on each segment, and in the complete absence of discoid pores.

Mr. Fox-Wilson, to whom I am indebted for these interesting specimens, informs me that they were taken 'on the roots of *Abutilon* sp., at Eastringham, Yorkshire.'

Nearly allied to *R. terrestris*, of Newstead, from which it may be distinguished by the greater number of enlarged trilobate pores. In *terrestris*, according to Newstead's description and figures, these pores are limited to a medio-longitudinal and a lateral series; whereas in *decoratus* there are transverse series (of from twelve

to twenty-four pores) completely encircling each segment of the body.

Luzulaspis scotica n. sp. (Fig. 5.)

Adult female and ovisac superficially resembling *L. luzulae*; the ovisac averaging slightly longer. Antennae (a) long and slender, 8-jointed, the 3rd longest, the 8th shortest. Limbs long and slender, especially the tibio-tarsal joints (b), which—together—are considerably longer than the femur, the tibia alone (of the third leg) being only slightly shorter than the combined femur and trochanter. Marginal setae (c) rigid, acicular, acutely pointed; longest on the frons; rather closely set, the intervals being less than the length of the setae—on the frontal area, and approximately equal to the length of the setae—on the other areas. Stigmatic setae (d) long, relatively slender, curved. Other characters as in *luzulae*. Length 3.75–4 mm. Breadth, across middle of body, 1.25–1.5 mm.

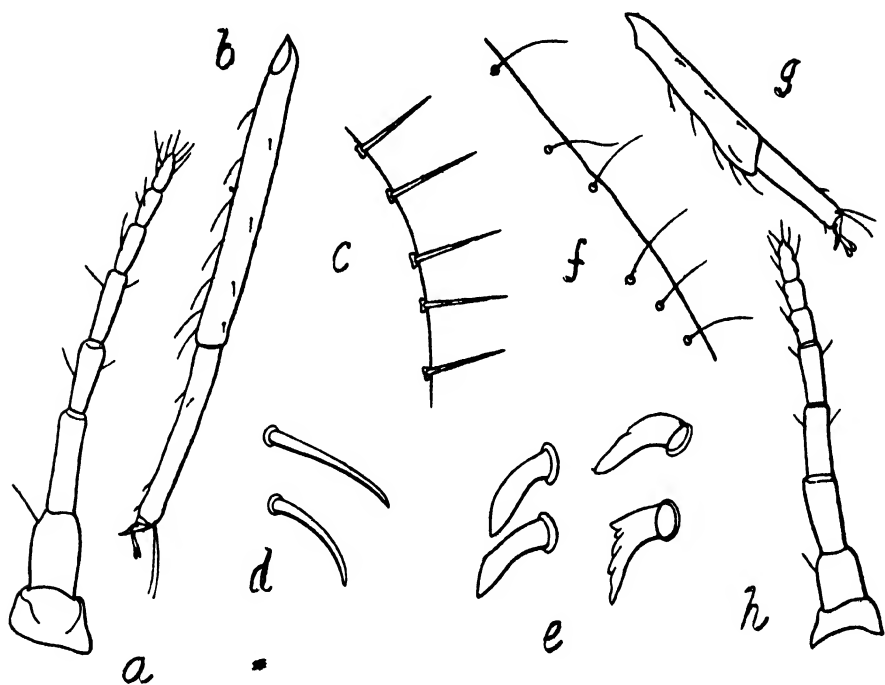


Fig. 5. *Luzulaspis scotica*. (a) Antenna, $\times 130$. (b) Tibia and tarsus of 3rd leg, $\times 130$. (c) Marginal setae, $\times 450$. (d) Stigmatic setae, $\times 450$.

Luzulaspis luzulae. (e) Stigmatic setae, $\times 450$. (f) Marginal setae, $\times 450$. (g) Tibia and tarsus of 3rd leg, $\times 130$. (h) Antenna, $\times 130$.

On undetermined grasses, in swampy places, Aberlady, Haddington, Scotland; August. Subsequently taken, in similar situations, at Garth, Breconshire; September.

Readily distinguishable from *luzulae* by the characters of the marginal setae (cf. c and f), of the stigmatic setae (cf. d and e), and of the limbs (cf. b and g).

Aspidiotus (Selenaspidus) pumilus Brain. (Fig. 6.)

Brain, 'Bull. Ent. Res.,' September, 1918, p. 133.

This species is one of the section (characteristic of *Selenaspidus* and *Pseudaonidia*) in which the cephalothorax is demarked by a lateral incision on each side and a more or less sharply defined transverse crease (see Fig. 6a). *Pseudaonidia* is differentiated from *Selenaspidus* by the presence of a conspicuous latticed area on the dorsum of the pygidium.

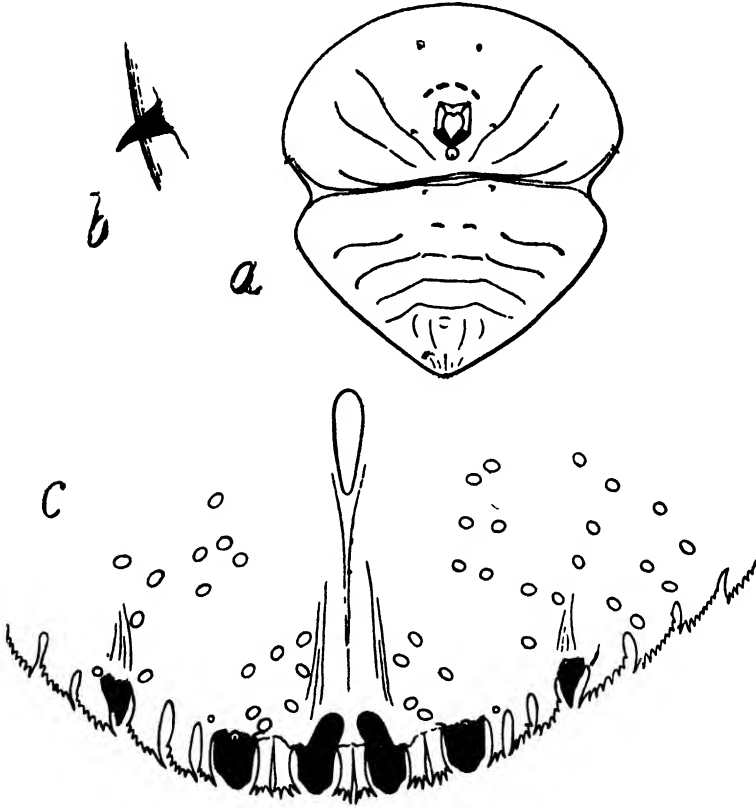


Fig. 6. *Selenaspidus pumilus*. (a) Adult female, $\times 30$. (b) Thoracic spur, $\times 220$. (c) Pygidium, $\times 450$.

S. pumilus is the smallest of the group, its total length seldom exceeding 1.25 mm., while its breadth (across the mesothorax) is approximately equal to its length. There is a prominent chitinous spur (b) on each side of the thorax. The pygidium (c) bears six well developed trullae, the inner four broad and obscurely shouldered on each side, the outermost pointed and tusk-like. The squamulae are broad, slightly longer than the trullae and deeply fimbriate. The anal orifice is elongate and narrow. There are no perivulvar pores.

The puparium of the female is circular, depressed, opaque white, with the yellow exuviae approximately central. Diameter averaging 2 mm.

On *Euphorbia* sp. Collected by Dr. R. S. MacDougall in one of the plant houses of the Royal Botanic Gardens, Edinburgh. The species is a South African one, and found its way into this country on a plant exhibited in the South African Court at the Empire Exhibition, Wembley, whence it was transferred to Edinburgh. In its native country *pumilus* is said to infest New Zealand Flax (*Phormium tenax*).

Chionaspis exalbida Kll.

Cockerell, 'The Entomologist,' 1902, p. 112.

This is another introduction, *via* the Wembley Exhibition (South African Court), where Mr. R. Stenton found a single plant of *Aloe variegata* to be heavily infested by the species.

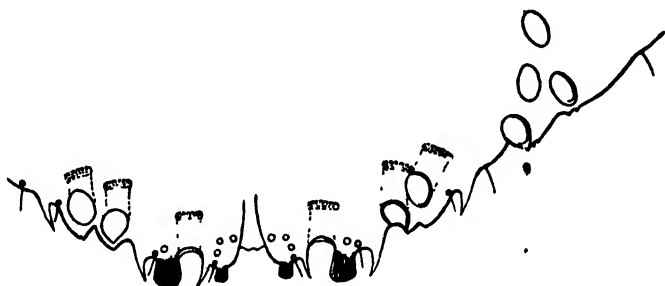


Fig. 7. *Chionaspis exalbida*. Posterior margin of adult female, $\times 450$.

The male and female puparia are snowy white, the former more or less distinctly tricarinate. The microscopical characters of the female are rather indefinite, owing to the fact (noted by both Cockerell and Brain) that the insect is entirely membranous, the pygidium being no more densely chitinized than the rest of the body. As Brain remarks, 'The projecting parts (of the pygidium) are very delicate, and these, as is also the case with the plates (squamae), are often bent back in mounting, and in many instances they might be considered absent.' This lack of definition may be taken as one of the more distinguishing characters of the species. My drawing of the posterior margin of the pygidium (Fig. 7) is the result of an attempted restoration of the characters observed in a series of ten preparations, and agrees fairly closely with that given by Brain. The median trullae are very small, widely separate and mounted upon rounded prominences. There is a single pair of larger lateral trullae. A noticeable character is

the unusually large size of the marginal and dorsal duct-pores. Cockerell, in his original description, states that there are 'no circumgenital glands' (perivulvar pores). Brain corrects this, from examination of specimens in his collection labelled 'part of original material submitted to Prof. Cockerell,' and I can corroborate his statement that 'there are five well defined groups of circumgenital glands.'

Cockerell justly remarks 'This is not a true *Chionaspis*, but there is no other genus to receive it.' It differs from typical *Chionaspis* in the absence of duplex lateral trullae.

Chionaspis salicis L.

A new host plant for this species was observed in my garden, where a large plant of *Helianthemum* (a cultivated variety) was so heavily infested that it succumbed to the attack. Every stem of the plant was thickly encrusted with the scales.

Aulacaspis rosae (Bouché).

Mr. St. John Marriott has sent me specimens of wild rose stems heavily infested by *Aulacaspis rosae*. In a covering letter he reports that he found the insects 'killing out the roses and brambles for a distance of at least one hundred yards along the side of a road at Mersea, Essex.' The species is a frequent (but seldom serious) pest on cultivated rose plants. It is much less common on wild plants, and I have not before heard of such a heavy and fatal infestation as is described by Mr. Marriott.

In our present incomplete knowledge of the distribution of British *Coccidae*, the following locality records may be useful.

WALES (Breconshire, Llangammarch), September :—*Ortheziola vej dovskyi*, in profusion under moss; *Newsteadia floccosa*, a single example under moss; *Physokermes abietis*, common on Spruce; *Eriopeltis festucae*, abundant on grasses; *Luzulaspis luzulae*, in profusion on the Field Wood-rush; *Luzulaspis scotica*, on an undetermined grass; *Lecanium capreae*, on Alder and Hazel; *Pulvinaria vitis*, on Birch; *Eriococcus insignis*, sparsely on grasses; *Pseudococcus walkeri*, on grasses; *Trionymus pulverarius*, at the base of grasses; *Chionaspis salicis*, on Alder and Ash.

SCOTLAND (Haddington), August :—*Orthezia cataphracta*, abundantly under moss, on Monument Hill; sparsely at Canty Bay and on N. Berwick Law; *Phenacoccus aceris*, ovisacs on Ulex, N. Berwick Law; *Trionymus pulverarius*, abundant at the base of Sheep's Fescue and other grasses, Gullane and Aberlady;

Trionymus hibernicus, in moss and at the roots of grasses and small herbaceous plants, Gullane; *Pseudococcus walkeri*, on grass (*Hordeum* sp.), Aberlady; *Ripersia* (?) *europaea* var., in turf on rocks, N. Berwick Law; *Eriococcus insignis*, on grasses, Gullane, Aberlady and Canty Bay; *Eriococcus greeni*, a single example on grass, on Monument Hill; *Eriopeltis festucae*, abundant on Monument Hill, a pigmy form on Sheep's Fescue at Gullane; *Luzulaspis luzulae*, abundant on Wood-rush and grasses, Gullane; *Luzulaspis scotica*, on grasses in swamp, Aberlady; *Chionaspis salicis*, on ash, Gullane.

In the earlier part of this article (published in the July number of the Magazine) there were several errata which I take this opportunity of correcting.

p. 172, line 2. The word 'several,' which has been repeated, should be deleted.

" " For 'or' read 'of.'

p. 174, line 24. For 'respectively' read 'relatively.'

" line 25. Insert 'or' after the word 'more.'

p. 176, line 9. For 'melio-ventral' read 'medioventral.'

Way's End, Camberley,

June 3rd, 1926.

A NEW FORMOSAN GALL-MIDGE. (DIPTERA, ITONIDIDAE [CECIDOMYIDAE].)

BY E. P. FELT, STATE ENTOMOLOGIST OF NEW YORK.

The peculiar species described below was received from Prof. R. Takahashi, Research Institute, Department of Agriculture, Taihoku, Formosa, and labelled as having been reared from pineapple, the date being November 20th, 1924. Subsequent correspondence developed the fact that the pineapple was infested by a species of *Pseudococcus*, and it very probable that this species is a predator.

SCHIZOBREMIA, n. gen.

This insect falls in our 'Key to Genera,' N.Y. State Museum Bulletin 257, p. 163, with *Chelobremia* Kieffer, from which it is most easily separated by the three symmetrically well developed circumfila and the distinctly minor tooth on the anterior and mid claws. Type *S. formosana*.

Schizobremia formosana, n. sp.

♂. Length 1.5 mm. Antennae nearly as long as the body, thickly haired, fuscous yellowish, fourteen segments, the fifth with the stems having a length $1\frac{1}{2}$ and $2\frac{1}{2}$ times their diameter respectively, the basal enlargement sub-globose, with a sub-basal whorl of long stout setae and a sub-apical whorl of moderately long and stout circumfila; apically there is at least one and possibly two or three oval pore-like structures apparently not connected with either the setae or circumfila; distal enlargement sub-pyriform, with a length $\frac{1}{2}$ greater than

its major diameter and basally and apically moderately long, stout, symmetrical circumfila, a rather thick whorl of long stout setae near the middle; terminal segment, basal enlargement sub-globose, basal portion of the stem with a length about 4 times its diameter, the distal enlargement sub-cylindrical, with a length $\frac{1}{2}$ greater than its diameter and apically a short finger-like process. Palpi—first segment short, quadrate, the second narrowly oval, with a length about $2\frac{1}{2}$ times its width, the third a little longer and more slender than the second. Mesonotum dark brown, the sub-median lines yellowish; scutellum and postscutellum yellowish. Abdomen mostly fuscous yellowish, the dorsal sclerites light brownish. Wings hyaline, sub-costa uniting with the margin at the basal third, the third vein at the apex, the fifth at the distal fourth, its branch at the basal half. Halteres whitish-transparent. Legs mostly dark straw, the posterior tarsi with the segments basally narrowly whitish; claws stout, curved almost at right angles, the anterior and mid claws unidentate, the pulvilli rudimentary. Genitalia—basal clasp segment moderately long, stout; terminal clasp segment short, rather slender, strongly curved, pectinate apically; dorsal plate broadly and roundly emarginate. Other characters indistinct in the preparation.

♀. Length 1.5 mm. Antennae about $\frac{3}{4}$ the length of the body, thickly haired, fuscous yellowish, 14 segments, the fifth with a stem $\frac{1}{4}$ the length of the cylindrical basal enlargement, the latter with a length $2\frac{1}{2}$ times its diameter; terminal segment cylindrical, with a length about 4 times its diameter, broadly rounded apically; labrum, sub-laterally with rather long, curved, divergent setae; mesonotum yellowish-brown; scutellum and postscutellum pale yellowish; abdomen mostly pale yellowish; halteres whitish, slightly fuscous sub-apically; legs mostly light straw; ovipositor short, the lobes moderate and dorsally with narrowly oval appendages $\frac{1}{2}$ the length of the basal portion. Other characters practically as in the ♂.

Type Cécid. A 3446, N.Y. State Museum.

Albany, New York,

May 26th, 1926.

NOTE ON THE GENUS *PLAGIARTHURA* KEYS.

BY MALCOLM CAMERON, M.B., R.N., F.E.S.

This is incorrectly regarded as a subgenus of *Atheta*, but it must be elevated to generic rank, and indeed forms a new group (*PLAGIARTHURINI*) of the *Aleocharinae* having the tarsal formula 4, 5, 5 (*Monotetramera*), which may be indicated as follows:—

- | | |
|-------------------------------|-----------------|
| 1. Maxillary palpi 4-jointed. | |
| Labial palpi 1-jointed. | PRONOMAEINI. |
| Labial palpi 2-jointed. | THIAMIAEINI. |
| Labial palpi 3-jointed. | ATHETINI. |
| Labial palpi 4-jointed. | PLAGIARTHURINI. |
| 2. Maxillary palpi 5-jointed. | |
| Labial palpi 4-jointed. | HOPLANDRIINI. |

The last group is represented in this country by *Exaleochara* Keys (? *Tinotus* Shp.).

15 Teesdale Road, Leytonstone, London, E.11.

July 5th, 1926.

NOTES ON THE EMPIDIDAE (DIPTERA), WITH ADDITIONS AND
CORRECTIONS TO THE BRITISH LIST.

BY J. E. COLLIN, F.E.S.

(Continued from p. 159.)

We come next to a small group of species which have no polished spot on the sternopleura above base of middle coxae. This includes the *T. candicans* Fln. and *cursitans* F. of the List.

T. candicans Fln. with its very narrow frons, evenly and deeply-bowed discal vein and often partly yellow abdomen, was correctly recognised by Zetterstedt and Lundbeck; but *T. cursitans* F., though recognised by Zetterstedt in specimens received from Staeger, was described by Lundbeck under the name *fasciata*, his *cursitans* being pale-legged specimens of *T. laticincta* Walk.

Two other specimens belonging to this small group are:—

T. verralli, n. sp., ♂ ♀. Antennae short, yellow in male, the third joint brownish in female. Dorsocentral bristles on thorax rather long and distinct. Legs yellow with distinctly annulated tarsi; middle tibiae with a stout, pointed, spur. Abdomen with greyish front margins about the sides and side margins to segments, and with the sternites dusted greyish in male, shining in female. Length 2.25–2.75 mm.

A widely-spread species which I found in some numbers at such distant places as Ivybridge (Devon) and Dornoch (Sutherland), while it has occurred in numerous localities between.

T. leucocephala v. Ros., ♂ ♀. A yellow species with thorax dusted greyish and abdomen a little dusted at sides. Antennae with basal joints pale yellow; third joint longer than arista, yellow at base, dusky towards tip, more extensively so in female. Vertical bristles close together. Acrostichals bi- to tri-serial. Legs yellow with pale brown annulations to tarsi; spur to middle tibiae strong but blunt. Wings slightly yellowish with yellow veins. Length 2.5–2.75 mm.

This species is not common, but has been taken at Wye (Kent), Wormsley Park, near Stokenchurch (Oxford), Newmarket (Suffolk) and Kirtling (Cambs) in May, June and July. Mr. A. H. Hamm has also found it at Bayswater Brook, near Oxford. Oldenberg has redescribed (Deutsche Ent. Zeit., 1924, p. 235) the type of this species.

Finally there are the species with the antennae partly or entirely yellow and the sternopleura with a bare polished spot. Of these, two have a distinctly yellow ground colour though the thorax is more or less dusted greyish, they are:—

T. exilis Meig. This is the *T. lutea* of the List, but the true *lutea* Fln., *glabra* Mg. and *pallida* Mg. are all the same species

which belongs to a different group and must in future be known as *lutea*, leaving the present species to be known as *exilis*.

T. luteola, n. sp., ♂ ♀. A yellow, slightly dusted greyish species with dull grey occiput; pale whitish-yellow antennae with the third joint shorter than arista; vertical bristles very wide apart; acrostichal bristles biserial; legs yellow, the front tarsi in the male only with darker yellow annulations; middle tibiae with a stout blunt spur in male, but pointed in female. Wings pale yellowish with yellow veins.

Length 2.5 mm.

Described from specimens taken by Dr. J. H. Wood in Herefordshire:—a male at Mordiford on July 31st, 1913, and three females, one at Stoke Wood on June 17th, 1912, and the others in the Monnow Valley on June 20th, 1912, and August 6th, 1913.

The next six species have the third antennal joint entirely pale or a little yellowish-brown (usually in the female only) towards the tip. Those in the 'List' are *albicornis* Zett., *divisa* Walk. and *flavicornis* Meig., while *major* Zett. was added in 1913 by Mr. A. E. J. Carter (Scott. Naturalist, p. 30). The *T. albicornis* described by Zetterstedt was not the same species as the one he received from Staeger under that name; his description appears to have been drawn up from his own Swedish specimens, so I retain his name in that sense and rename Staeger's specimens (which were described by Lundbeck as *albicornis* Zett.), giving them the name **pallidicornis** n. n. Both these species occur in Britain and the true *albicornis* may be known by its wider frons and face, almost quadriserial acrostichals, not annulated tarsi—only the last joint with apical half darkened—, spur to middle tibiae longer than in *pallidicornis* and blunt.

T. divisa Walk. is a very little-known species with the third antennal joint entirely yellow in male but darkened towards tip in female; acrostichals biserial; legs yellow with tarsi longer than usual and last tarsal joint darkened on apical half, but the front tarsi (especially in the male) has the tip of each joint darkened on the underside only; middle tibiae with a stout and pointed spur in male but somewhat trowel-shaped in female. Wings with the extreme tip faintly clouded.

Mr. F. Jenkinson found it at Crowborough (Sussex) on June 24th, 1913, and Mr. A. H. Hamm at Bagley Wood, near Oxford, on May 27th, 1916.

The remaining species have normally a much darker third antennal joint and include some of the most variable species and some of the most difficult to name. Those already in the 'List' are *fasciata* Meig., *pallidiventris* Meig., *laticincta* Walk., *calceata* Meig., *ecalceata* Zett. and *articulatus* Macq., while *annulipes* Meig. was added by Mr. A. E. J. Carter in 1913 (Scott. Naturalist, p.

36). Of these the true *fasciata* Meig. has seldom been correctly recognised. It is a large species with remarkably broad dusted grey markings on abdomen which have a shining black triangle on the middle of each of the 4—5 middle segments; the short biserial acrostichals and the dorsocentrals have a tendency to be dark; the legs are very strong, the front and hind tibiae have a few small dark bristles above, and the middle tibiae end in a long strong pointed spur, the tarsi brownish annulated; the third antennal joint is rather narrow and pointed and is shorter than the arista. Lundbeck's *fasciata* was *cursitans*, and the *fasciata* of Kowarz's collection a different species. Meigen's type in the Paris Museum is identical with our British species.

T. laticincta Walk. This species varies considerably in the colour of the legs, from having them entirely pale to specimens with the front coxae about base and all the femora extensively darkened; the tarsi however are never annulated. Lundbeck described it as *cursitans*, but I could find no specimens under this or any other name in Zetterstedt's collection.

T. articulata Macq. I accept the interpretation which Zetterstedt and Lundbeck have given this species, our British specimens being the same as theirs.

T. annulipes Meig. Another variable species in regard to the colour of its legs; the tarsi are always annulated, the front tarsi sharply and distinctly so, but the rest of the legs may be entirely yellow, or the front coxae and middle femora a little obscured, or the front coxae and basal half or more of front femora may be blackish (the type form), or the middle femora in addition may be extensively darkened; in my experience the females always have pale legs, or at most the middle femora a little obscured about middle. *T. infuscata* Meig. is a synonym. The spur to middle tibiae is always blunt.

T. ecalceata Zett. This species might almost be placed in the section with yellow third antennal joint, but as this joint even in the male is always brownish towards the tip, and more extensively so in the female, I leave it here. It is a greyish species with short third antennal joint; biserial acrostichals with the rows very close together, especially in front, and the hairs somewhat divergent; abdomen with the basal margins of first two or three segments at sides dusted greyish; legs entirely yellow with tarsi rather longer than usual and immaculate, spur ~~no~~ middle tibiae long and sharp-pointed; wings slightly yellowish with yellow veins.

At present known from only Scotland (Loch Assynt, Rannoch and Aviemore). *T. calceata* (of which species *ecalceata* has been considered a synonym) is a smaller species with smaller, darker third antennal joint and the last joint or two of all tarsi blackish.

Other British species belonging to this group are:—

T. pictitarsis Becker. A small species with yellow legs (rarely the front coxae and base of front femora darkened) and annulated tarsi; acrostichals biserial, the hairs divergent, middle tibiae with a sharp pointed spur. I have compared British specimens with two of Becker's original males from Birket-el-Karun (Egypt) and have very little doubt that they are the same species.

Has occurred at Frinton-on-Sea and Walton-on-Naze (Essex), Wicken and Kirtling (Cambs), Newmarket (Suffolk) and Windsor Forest (Berks), while Mr. A. H. Hamm has taken it near Oxford.

T. stigma, n. sp., ♂ ♀. Third antennal joint brownish-black or black, longer than arista. Thorax whitish-grey, acrostichals biserial, rather numerous short hairs between the dorsocentrals and sides of thorax. Abdomen dusted at sides and along the basal margin of segments. Legs pale yellow, tarsi not annulated; spur to middle tibiae extremely short and blunt. Wings with the end of subcostal vein much widened out and the whole of the dilation of a brown colour giving the wing an appearance of possessing a darkened stigma.

Length 2·2-2·25 mm.

I obtained numerous specimens of this species by sweeping a shrub (*Buxus sempervirens*) in my garden at Newmarket (Suffolk) on May 24th, 1914.

T. extricata, n. sp., ♂ ♀. Very near to *pallidiventris* Meig., having the same third distinct notopleural bristle on front part of notopleural depression, and small bristles above front and hind tibiae; easily distinguished in the male by the fact that only the last joint of tarsi is darkened, whereas in *pallidiventris* the tarsi are annulated; the third antennal joint is always a little paler about the base and the front tibiae stouter. In the females the tarsi of both species are annulated, but the thoracic dusting appears to be a little more dense in *extricata*, the base of third antennal joint paler, and the dusted side margins to abdominal segments a little more evident.

Length 2·75-3 mm.

Not uncommon in numerous localities from South of England to Sutherland in Scotland.

T. subtilis, n. sp., ♂ ♀. Much like a very small pale-legged *annulipes*, having a similar head and rather sparsely-dusted thorax, but acrostichals and dorsocentrals slightly longer; tarsi more slender and less sharply annulated; the 'knee' at extreme base of middle tibiae is always darkened in *annulipes* but is yellow in *subtilis*. Wings slightly yellowish and with all veins yellow, whereas in *annulipes* the wings are yellowish on the upper half, but more dusky at tip and below and the veins there brownish, the postical vein being often faintly clouded. In *subtilis* there is a sexual dimorphism in the apical spur to middle tibiae; in the male this spur is blunt with a tiny recurved point much as in *annulipes*, while in the female the spur is sharp-pointed.

Length 1·5-2 mm.

Known at present from only Abergavenny (Monmouthshire) and the Monnow Valley (Herefordshire), where it was taken in August 1910.

There are, in addition, a number of names of species in the List which are mainly synonyms, as follows:—

T. flavipennis Walker. Two females in the Entomological Club Collection are specimens of *exilis* Meig.

T. formalis Walker. A female without abdomen in the same Collection is undoubtedly only *lutea* Flin.

T. pulchellus Walker. A female in the same Collection is *pectoralis* Fln.

T. munda Walker. A female in the same Collection is *rapida* Meig.

T. compta Walker. A dozen specimens in the same Collection are *nigritarsis* Fln.

T. dubia Walker. The one specimen without end of abdomen in the Entomological Club Collection is *agilis* Meig.

T. commilis Walker. Under this name in the same Collection I found a male of *agilis* and a female of *pallipes*. The description appears to apply best to the female.

T. compungens Walker. A female in the same Collection is *ciliaris* Fln.

T. robusta Walker. A male in the same Collection in *pallidiventris* Mg.

T. varia Walker. Three females (one without abdomen) in the same Collection are *candicans* Fln.

T. glabra Meig. A synonym of *lutea*, according to the type in Paris Museum.

T. dissimilis Fln. Transferred to the genus *Symballophthalmus*. The *Dysaletria* sp. ! of the List referred to the same species.

T. pubicornis Zett. Is a synonym of *longicornis* Meig. according to the types in Zetterstedt's Collection.

T. fascipes Meig. and *T. fulvipes* Meig. According to Meigen himself (Syst. Besch. vi. 342) these names represent the same species. The labelled female type of *fascipes* in the Paris Museum is a specimen of *annulata* Fln.

T. castanipes Meig. A male in the Paris Museum is *albiseta* Panz.

T. exigua Meig. A female in the same Museum is *minuta* Mg.

T. dichroa Meig.* A male in the same Museum is *pallidiventris* Mg.

T. infuscata Meig. in the same Museum is a pale-legged specimen of *annulipes*.

T. bicolor Meig. I cannot recognise this species in the absence of type specimens. Meigen's original description (which was copied by Fabricius) was of a large species (length 2 lines) with antennae pale at base and tarsi not annulated. Meigen subsequently applied the name to a smaller species (length $1\frac{1}{2}$ lines), with annulated tarsi. I propose to treat the species as unrecognisable.

Subf. OCYDROMINÆ.

BICELLARIA Macq. (CYRTOMA Meig.).

It appears to be necessary according to the Rules of Nomenclature to revive Macquart's earlier name of *Bicellaria* for the genus standing in the 'List' as *Cyrtoma* Mg. Three additional species (*intermedia* Lundbk., *pilosa* Lundbk. and *simplicipes* Zett.) were added to the List in 1913 (Ent. Mo. Mag., pp. 104-105). *B. melaena* Hal. is a synonym of *spuria* Fln.

B. sulcata Zett. This species was considered by Lundbeck in 1910 to be a synonym of *spuria* Fln., but he has since informed me that he agrees with me in considering it a distinct species. The face is rather narrower than in *spuria* and the hind tibiae conspicuously more dilated, while the front tibiae have no postero-ventral ciliation of fine hairs such as are present in *spuria*. We appear to possess two forms of *sulcata* in Britain, one more common in the North (the true *sulcata*), the other (subsp. *vana*) which is common in the South. The subsp. *vana* has the thorax and abdomen of the male rather duller black when viewed from behind, the thorax of the female rather more shining and the legs of both sexes shorter haired than in typical *sulcata*.

The following two species appear to be new to science :—

B. nigrita, n. sp., ♂ ♀. Two basal joints of hind tarsi dilated as in *nigra* and *intermedia*, but without the bristles above third antennal joint of *intermedia*. Hind legs shorter and rather stouter than in *nigra*, and all tarsi rather shorter. Middle tibiae with less difference between the longer and shorter bristles above.

Captured by the late Mr. Verrall in Kent (St. Mary Cray), Sussex (Abbot's Wood), Berks (Windsor Forest) and Oxfordshire (Wormsley Park) on dates ranging from June 9th to July 7th. There was a female in Kowarz' Collection labelled *Cyrtoma basale* Lw., but I cannot find that Loew ever described such a species.

B. subpilosa, n. sp., ♂ ♀. Somewhat intermediate between *pilosa* Lundbk. and *sulcata* Zett. Less strongly bristled than in *pilosa* and without any small bristle above third antennal joint. Front tibiae with a ciliation of fine hairs posteroventrally and with rather more slender hind tibiae than in *sulcata*; in both these respects more resembling *spuria*, but whole insect longer-haired than in that species, thorax not so dull black, with longer pubescence; legs longer-haired, especially beneath hind tibiae.

A not uncommon species in Scotland from end of May to end of June, I have records from Inverness, Nairn, Argyll and Stirling. The species occurs in Scandinavia and in mountainous districts of Central Europe.

(To be continued.)

Atheta (Ceritaxa) spissata Muls. et Rey—a correction.—In Mr. J. H. Keys's paper on this insect in the July number of this Magazine, the upper block on p. 160 has inadvertently been printed upside down, and the names attached to figures 1 and 3 should therefore be transposed; thus reading—1. *dilaticornis*, 2. *spissata*, 3. *testaceipes*.—EDS.

Phyllodrepa puberula Bernh. in Yorkshire.—Some time ago Dr. N. H. Joy kindly examined two specimens of a *Phyllodrepa* which have been in my collection for some years, and pronounced them to be *P. puberula* Bernh., a species recently recorded in this Magazine as British by Mr. J. H. Keys (antea, p. 49). Both my examples were taken at Saltburn, one in 1900 and the other in 1906. With respect to the first insect I have a note that it was found in a dead bird on the coast at the end of September. This situation may, however, have been accidental, as many beetles are to be found on the coast after autumn winds from the land. Of the habitat of the second I have no record.—M. L. THOMPSON, 40 Gosford Street, Middlesbrough: June 1926.

Delayed emergence of Chrysopora stipella Hb. var. *naeviferella* Dup.—In the autumn of 1923 I found the conspicuous white blotches made by this Gelechiid to be plentiful in leaves of *Chenopodium album* and *Atriplex patula* on waste ground at Oxford. In order to obtain a good series of the moth, I collected a large number of the larvae between September 10th and 21st, and obtained many pupae. Four more larvae were added on October 29th. The pupae were kept indoors, along with many other pupae of Micro-Lepidoptera, being placed in winter on a mantel-shelf, beneath which a fire was lighted nearly every day, and in summer close to a window facing south. Sixty-one moths were bred, the first emerging on October 21st, 1923, the last not till October 17th, 1925, two years later. Within this lengthy period the emergences were fairly well distributed, as the following figures will show:—1923, October, 1; November, 0; December, 2; 1924, January, 1; February, 0; March, 2; April, 3; May, 7; June, 9; July, 5; August, 5; September, 7; October, 4; November, 1; December, 4; 1925, January, 3; February, 2; March, 1; April, 0; May, 2; June, 0; July, 1; August and September, 0; October, 1. On looking through the pupae in March, 1926, I found them all to be empty. It is difficult to believe that the indoor treatment was responsible for this remarkable retardation; I have bred large numbers of Tineina indoors during the last few years, and in almost every case the effect of warmth has been to hasten emergence. In all probability the retardation is natural. Although Stainton and Meyrick give *C. stipella* as a definitely double-brooded species, in my experience it may be found in the open at any time from April to September.—E. G. R. WATERS, 184 Woodstock Road, Oxford: July 24th, 1926.

A note on Prosopis kriechbaumeri Forst.—The duck decoy, where and at Wicken Fen Perkins first took this bee in Britain (E.M.M. 1900, pp. 49, 50, and 1906, p. 176: I have a metatype labelled by him 'Tud.Fen,vii.99'), is now quite decayed and, with the exception of some ten feet of reed-screen, rotted totally away. This section of ten feet is individually wired erect to the adjoining willows, but it does not appear to have been renewed since that time. Doubtless in the hollow dead reeds of the old screen the *Prosopis* nested, its headquarters being at a hand-bridge across a dyke in the Fen alongside, where I took over

forty specimens on June 19th, 1901. This bridge has now vanished, and a protracted watch upon the remaining scrap of screen revealed nothing on July 21st, 1926. The locality is nowadays so neglected and so thoroughly reverted to its virgin condition that *P. kriechebaumeri* is likely to be extinct in Britain; I have heard of no later records from Cambs, and my sole one from elsewhere (*op. cit.*, 1903, p. 27) does not appear to have been repeated. I have visited Tuddenham Fen annually since 1899 but have observed no specimens since 1902. In Suffolk the species occurred within those years, all over the fens of both the Lark and Little Ouse rivers at Brandon, Herringswell, Icklingham and Tuddenham.—CLAUDE MORLEY, Soham House, Suffolk: July 24th, 1926.

Reviews.

'THE FAUNA OF BRITISH INDIA, INCLUDING CEYLON AND BURMA,' Coleoptera. Chrysomelidae (Chrysomelinae and Halticinae), by S. MAULIK, M.A., F.Z.S., etc.: pp. xiv and 442, with 139 text-figures and map: Taylor and Francis, London.

This volume, the third on the Chrysomelidae and the ninth on the Coleoptera, so far as issued, deals with the two sub-families Chrysomelinae and Halticinae; the Galerucinae, very numerous in species in India, still requiring another volume for their enumeration. The first volume on this family, including eleven sub-families, by the late M. Jacoby, was issued in 1908, and the second, including the Hispinae and Cassidinae, by the writer of the present volume, in 1919. Of the Chrysomelinae, 18 genera and 63 species, and of the Halticinae 70 genera and 287 species, are now recorded. The very limited number of Chrysomelinae enumerated as compared with the numerous known European Alpine forms, must be in some measure due to imperfect collecting in the Himalayan region, and to lack of material from other places, not only in Chrysomelinae but in the Halticinae also. Moreover, as in the case of such difficult genera as *Haltica*, etc., the author contents himself by simply giving a list of the previously-recorded species, without any attempt to study the whole of the material before him. Many Halticids are given from Ceylon only, due to more systematic collecting in that island, and at least double the number of forms must exist in continental India. In the 'Introduction to the Chrysomelinae' (pp. 5-13) notes on the life-history of various representative genera are appended, as well as a list of those of economic importance, the Halticinae being treated in a similar way (pp. 100-113). The Halticid larvae selected for notice belong to the genera *Clitea*, *Longitarsus*, *Podontia*, *Phyllotreta*, *Haltica*, *Aphthona*, *Epitrix*, *Chaetocnema* and *Sphaeroderma*; the last-named is described from British examples of *S. testacea* F., found by Mr. Blair at Midhurst, Sussex, in 1918, mining the leaves of *Centaurea*. The generic name *Chrysolina* Motschulsky, genotype *Chrysomela staphylea* L., is used for *Chrysomela* L., and the latter, genotype *C. populi* L., for *Melasoma* Steph. (= *Lina* Redt.). As before, the author uses Sanskrit names for many of his new genera and species, giving the derivation in footnotes. The illustrations are somewhat crude, and the sex of the insect figured is seldom added. The editing and indexing leave nothing to be desired. This new volume on the Phytophagous beetles should be in the hands of all students of this section of the Coleoptera.

Society.

ENTOMOLOGICAL SOCIETY OF LONDON: *Wednesday, June 2nd, 1926.*—Professor E. B. POULTON, F.R.S., President, in the Chair.

The Chairman announced that Mr. R. W. Lloyd has been appointed a Trustee of the Society in place of the late Mr. W. Bateson.

The following was elected a Fellow of the Society:—C. W. Forde Wyatt, 14 Cavendish Square, London, W.1.

The following Fellows, having been proposed by the Council, were elected Special Life Fellows:—Professor R. Newstead, F.R.S., and Mr. F. W. Frohawk.

Mr. P. A. Buxton exhibited and made remarks upon an instrument for recording radiant heat. Dr. K. Jordan, the type of *Eumesia semiargentea* Feld., and showed that this insect is undoubtedly a Hesperiid. Mr. K. G. Blair, an aquatic Lampyrid larva from South Celebes. Mr. G. J. Arrow exhibited and discussed some instances of mimetic association in beetles. Mr. C. T. Bethune-Baker, a new species of *Zygaena* from the South of Spain. Professor E. B. Poulton, F.R.S., exhibited or made remarks upon: (a) on behalf of Miss C. Longfield, the witch-hazel-like smell of *Heliconius erato hydarus*; (b) on behalf of Mr. E. B. Ford, *Zygaena filipendulae* attracted by a bred female of *Lasiocampa quercus*; (c) on behalf of Dr. G. D. H. Carpenter, insects captured on a diseased banana leaf on one of the islands in the N.W. Victoria Nyanza; (d) *Abraxas grossulariata* larvae entirely devoid of black markings except on the head. Dr. R. J. Tillyard, F.R.S., stated that he had some highly interesting fossil insects which he would be happy to demonstrate, by arrangement, to anyone interested, and he undertook, at the invitation of the President, to give a lecture on this subject at one of the October meetings. Mr. H. Main exhibited a subterrarium containing a pupa of *Ocybus olens* in its natural resting position.

The following papers were read:—(1) 'On the British species of the genus *Lucilia*,' by Mr. O. W. Richards, B.A.; (2) 'Teratological Coleoptera,' by Dr. E. A. Cockayne, M.A.; (3) 'Abdominal glands in Heliconiid Butterflies,' by Dr. H. Eltringham, M.A.; (4) 'On Microlepidoptera from the Galapagos Islands and Rapa,' by E. Meyrick, B.A., F.R.S.; (5) 'On the structure of an organ in the hindwing of *Myrmeleon nostras*,' by Dr. H. Eltringham, M.A.; (6) 'On some Australian Coleoptera collected by Charles Darwin,' by Mr. A. M. Lea; (7) 'A study of Butterfly immigration in S. India and Ceylon,' by C. B. Williams, M.A.; (8) 'A new sub-family of Bythoscopidae (Homoptera, Jassodea),' by W. E. China; (9) 'The metamorphosis of certain Nymphalid butterflies of the genera *Charaxes*, *Euxanthe*, and *Palla*,' by Dr. V. G. L. van Someren; (10) 'The Biology of British Crabronidae,' by A. H. Hamm and O. W. Richards, B.A.; (11) 'Two new African Dragonflies,' by Major F. C. Fraser, I.M.S.; (12) 'On the Life-history of *Caligo ileoneus ileoneus*,' by L. D. Cleare; (13) 'On a new organ in the abdomen of *Eryphanis polyxene*,' by Dr. H. Eltringham, M.A.—S. A. NEAVE, *Hon. Sec.*

SOME INDIAN (AND TIBETAN) COLEOPTERA (20).*

BY G. C. CHAMPION, F.Z.S.

The twentieth contribution to this series is devoted to some additional Telephorids, *Rhagonycha*, *Lycocerus* and *Tylocerus* being reserved for a future paper. Very few Indian species seem to fall under *Cantharis* L. (*Telephorus* De Geer), s. str. A curious apterous Tibetan form found by Major Hingston at an elevation of 16,000 ft. is included. Three diagnosed by Hope in 1831 (*cf. antea*, p. 118) are redescribed.

The species enumerated in the present paper are as follows:—

<i>Podistra terricola</i> , n. sp.	<i>Discodon semiustum</i> Gorch.
<i>Prothemus</i> (n. gen.) <i>neglectus</i> , n. sp.	„ <i>chloropterum</i> , n. sp.
<i>Athemus cyanurus</i> Hope.	<i>Silis biangulata</i> , n. sp.
„ <i>rubricollis</i> Hope.	„ <i>ramifera</i> , n. sp.
„ <i>monostigma</i> , n. sp.	„ <i>nodosicornis</i> , n. sp.
„ <i>trimaculatus</i> Hope.	„ <i>latimanus</i> , n. sp.
„ — „ <i>v. unipunctatus</i> Hope.	„ <i>ochraceipennis</i> , n. sp.
„ <i>xanthogaster</i> , n. sp.	„ <i>fruhstorferi</i> Pic.
„ <i>podabroides</i> , n. sp.	„ <i>fuscitarsis</i> Gorch.
<i>Cantharis biocellata</i> Fairm.	„ <i>obscuritarsis</i> Pic.
„ <i>chumbiensis</i> , n. sp.	„ <i>bicolorimembris</i> Pic.
„ <i>granigera</i> , n. sp.	„ <i>unilamellata</i> , n. sp.
„ <i>semiopaca</i> Pic.	<i>Malthinus spissicornis</i> , n. sp.
„ <i>specialithorax</i> Pic.	„ <i>duploineatus</i> , n. sp.
	„ <i>4-nodosus</i> , n. sp.

PODISTRA Motschulsky.

Podistra terricola, n. sp.

♂. Elongate, robust, apterous, finely pubescent; black, the elytra with a bluish lustre, the mandibles and last two abdominal segments fulvous; head and prothorax shining, sparsely, very finely, the scutellum closely, punctured; elytra coriaceous, rugose; dorsal surface of abdomen (except along apical margin of each segment) opaque, alutaceous, and very minutely punctured, the ventral surface more shining and rugulose. Head narrower than prothorax, flattened between eyes, the latter small and depressed; antennae (imperfect) short, stout, joint 3 and following joints much longer than 2. Prothorax transversely sub-quadrate, with rounded angles, sharply margined at base and sides, sulcate down middle posteriorly (appearing binodose at base), the basal margin hollowed in centre. Elytra shorter than head and prothorax united, narrower than base of latter, widened behind, rounded and dehiscent at sutural angle. Abdomen long, showing nine segments exposed on dorsal surface, broad, narrowing from the third segment; lateral lobes of last segment long, broad, spoon-shaped. Legs stout; tarsal claws simple.

♀. Antennae shorter and less thickened.

Length $7\frac{1}{2}$ mm.

Hab. TIBET, Dinka La, alt. 16,000 ft. (*Major Hingston*: 18, vii, 1924).

* Continued from p. 137 *antea*.

Described from a pair still 'in copula.' Not unlike the alpine *P. rupicola* Kiesenw. ♀ * (for a specimen of which I am indebted to the late L. Ganglbauer), but much more robust, the head flatter, the eyes much smaller, the antennae stouter, the elytra metallic, etc. The males of all the described species of *Podistra* are winged, so far as at present known. *P. terricola* has the general aspect of an apterous Staphylinid or Galerucid.

PROTHEMUS, n. gen.

Head short, narrower than prothorax, smaller in ♀; antennae slender, joint 2 short; prothorax with expanded, reflexed margins, rounded in front and at the sides anteriorly, without trace of anterior angles or lateral notch or plica; tarsal claws simple in both sexes.

Type, *P. neglectus*, n. sp.

The Indian insect taken as the type of this genus (a specimen of which in the Oxford Museum is labelled, apparently in Hope's handwriting, with the MS. name '*neglectus*') seems to have long been known in collections, and *Telephorus huddi* Gorh. (1889) is probably conspecific with it. Two others are contained in the British Museum: one from Maymyo, Burma (♂), and one from N. China (♀); but till the two sexes are known these forms are best left unnamed. The structure of the terminal ventral segments is unlike that of *Themus* in both ♂ and ♀.

Prothemus neglectus, n. sp.

♂. Elongate, narrow, shining, finely pubescent; testaceous or rufo-testaceous, the antennae (joint 1 excepted), eyes, tibiae, tarsi, and abdomen in part, black; head and prothorax closely, very minutely, punctate, the elytra rugulose, feebly bicostate on disc. Head transversely depressed behind the eyes, the latter rather small, prominent; antennae very elongate, about reaching the apex of elytra. Prothorax narrowed anteriorly, broader than long, binodose on disc posteriorly, the hind angles very obtuse. Elytra much broader than prothorax, long, sub-parallel. Ventral segment 7 broadly arcuate-emarginate; lateral lobes of the genital segment very long, arcuate, imbricate at tip, the median lobe cleft at apex.

♀. Head narrower, eyes smaller, antennae much shorter, hind angles of prothorax rounded; ventral segment 7 very deeply triangularly emarginate in centre, leaving the plicate following segment partly exposed, and with a deep smooth sulcus on each side of the emargination posteriorly.

Var. 1. Legs entirely infusate (♀). [Assam.].

Var. 2. Legs (the apices of the tarsi excepted) testaceous (♀). [Ruby Mines, Burma.]

Length 10-15 mm.

Hab. Nepal (*Hardwicke*, in *Mus. Brit.*: ♂), Singhik [type] (*Major Hingston*: iv, 1924: ♂ ♀), Gopaldhara and Mungphu, in

* The female figured by Kiesenwetter (*Berl. ent. Zeitschr.* 1863, pl. 5, fig. 1) appears to belong to *P. birnbacheri* Kraus, see Ganglbauer, *Münch. Koleopt. Zeitschr.* iv, p. 78.

Sikkim (*Mus. Brit.*), Bengal (*Mus. Oxon* : ♀), Assam and Burma (*Mus. Brit.* : vars.).

Two ♂♂, numerous ♀♀, varying greatly in size.

ATHEMUS Lewis (1895).

Telephorus suturellus Motschulsky, a variable abundant insect in the Japanese Islands, is given as the type of this genus. Three closely-related Chinese insects, with a similar structure of the tarsal claws, were referred by Gorham in 1889 to *Ancistronycha* Mulsant, a section including various conspicuous Palaearctic Telephorids, all of which have the sides of the prothorax more strongly explanate than in the type of *Athemus*. The Indian species have the tarsal claws of the ♂ angulate at the base, and one of those of each of the anterior and intermediate pairs (as in *Ancistronycha*) armed with a straight, blunt tooth in the ♀, this hamus or tooth being sometimes reduced to a setigerous point in some of the smaller forms. The grooved antennal joints 4-8 and the bent hind tibiae of *A. suturellus* ♂ are secondary sexual characters peculiar to that species. The second antennal joint is always short in these insects.

Athemus cyanurus Hope.

'Flavo-rufus, elytrisque postice violaceis. Long. lin. $6\frac{1}{2}$; lat. $1\frac{1}{4}$.'

Telephorus cyanurus Hope, in Gray's Zool. Misc. 1831, p. 26.

Var. *Telephorus violacea* Hope, in Mus. Oxon.

Var.? *Telephorus cruralis* Gorh., P.Z.S. 1889, p. 98 (nec Leconte; re-named *Cantharis indica* by Pic, 1906).

♂. Elongate, robust, rather narrow, shining, cinereo-pubescent; testaceous or rufo-testaceous, the elytra with a nigro-caeruleous or violaceous patch of variable extent at apex (in some specimens extending forward along the disc to the base, in others occupying the apical third or half), the antennae (joints 1 and 2 excepted), tips of mandibles, tibiae, and tarsi infusate or black; head and prothorax very finely, the elytra rugosely, punctured. Head unimpressed, broad, the eyes rather small, prominent; antennae long, filiform, joint 3 twice the length of 2, 3-8 flattened beneath. Prothorax sub-trapezoidal, nearly as long as broad, sulcate down middle, and deeply obliquely hollowed and sulcate at the sides anteriorly, the hind angles pilose. Elytra elongate, narrowing from a little below base, in some specimens feebly costate. Legs stout, closely pubescent, the anterior femora hairy beneath; anterior tibiae compressed; anterior tarsi greatly dilated, joint 1 broad oval, wider than tibiae. Terminal (covered) ventral segment with a narrow inwardly-curved lobe arising from each side of the excavate edge of the emargination, the corresponding dorsal segment divided into two broad spoon-shaped lobes which are hollowed at the apex within.

♀. Broader; antennae shorter; prothorax more transverse; anterior tarsi

* In *A. xanthogaster* and *A. podabroides*, male, the anterior or intermediate tarsi have one claw hamate at base, much as in female.

narrower, the anterior and intermediate pairs each with one of the claws armed with a thorn-like tooth near base.

Var. 1. Elytra uniformly rufo-testaceous. [♀]. Sylhet, Chandkhira.

Var. 2. Elytra wholly metallic. [♂ : *violacea* Hope, in litt.; ? *cruralis* Gorh.]. Bengal, Dibru.

Var. 3. Smaller and less robust; elytra varying in colour as in Nepal types [♂ ♀]. Kangra Valley.

Hab. Nepal (*Mus. Brit.*, types; *Mus. Oxon*), Punjab, Bengal, Assam.

Redescribed from three ♂♂ and one ♀ from the Hardwicke collection; the var. 2 certainly, and the others probably, belong to the same species. Males from Nepal and Kangra have been dissected for comparison. A closely allied form occurs in Burma, *A. monostigma*, infra. The Chinese *T. (Athemus) prattianus, orientalis* and *bartoni* Gorh. have similar tarsal claws in ♀♀.

Athemus rubricollis Hope.

'Violaceus, thorace rubro, femoribusque rufis. Long. lin. 6½, lat. 1¾.'

Telephorus rubricollis Hope, in Gray's Zool. Misc. 1831, p. 26.

Telephorus brahminicus Gorh., P.Z.S. 1889, p. 98.

♂. Less elongate than *A. cyanurus*, rufo-testaceous, the elytra nigro-caeruleous, the antennae (joints 1 and 2 excepted), femora and abdomen in part, tibiae and tarsi black; elytra more rugose, sub-granulate, much narrowed posteriorly; hind angles of prothorax with projecting hairs; anterior femora and tibiae thickly clothed with long hairs; anterior and tarsi narrower, joint 1 not wider than tibiae.

♀. Differing from ♂ as in *A. cyanurus*.

Var. 1. Smaller (length about 11 mm.); femora and abdomen testaceous. [♂]. Sylhet.

Var. 2. Head in part, two faint spots on disc of prothorax, scutellum, legs and abdomen, black. [♀]. Assam.

Var. 3 ? Head (except in front) black; prothorax, scutellum, femora at base and beneath, and abdomen, testaceous. [♀]. Burma.

Hab. Nepal (*Mus. Brit.* : types of Hope, ♂ ♀); Assam (type of Gorham, and var. 2), Chandkhira, Sylhet (*Mus. Brit.* : var. 1); Burma, Momeit (*Doherty* : var. 3).

Redescribed from the Hope types and a ♂ from Sylhet in the British Museum. The vars. 2 and 3 apparently belong to the same species, the head, legs and abdomen varying in colour. The less elongate, rugosely granulate elytra should separate *A. rubricollis* from the similarly-coloured variety of *A. cyanurus*, which also has a broader basal joint to the anterior tarsi in ♂.

Athemus monostigma, n. sp.

♂. Elongate, narrow, shining, thickly, the head and prothorax sparsely, pubescent, the prothorax ciliate with long hairs at the hind angles; rufo-testaceous, the elytra flavescent, the antennae (joints 1 and 2 excepted), tips of

mandibles, an oval spot on the disc of prothorax, and legs (the bases of femora excepted) infusate or black; the head and prothorax finely, the elytra rugosely, punctured, the elytra sub-costate. Head almost unimpressed, the eyes prominent; antennae slender, filiform, very long, joint 3 twice the length of 2, 3-7 flattened beneath. Prothorax nearly as long as broad, narrowed from base, obliquely hollowed on each side anteriorly and sulcate down middle. Elytra wider than prothorax, elongate, rapidly narrowed posteriorly. Anterior femora and tibiae closely pilose beneath; inner or outer claws of anterior and intermediate tarsi angulate at base. Terminal (covered) ventral segment with a short, curved, hook-like lobe on each arising from the concave edge of the emargination; the corresponding dorsal segment divided into two broad concave lobes, the ventral portion of each of which is twisted inward at the apex into an overlapping hammer-shaped clasper.

♀. Antennae shorter; prothorax broader; one of the claws of anterior and intermediate tarsi with a long, straight, blunt tooth near base.*

Var. *Elytra nigro-caeruleous* (♀).

Length 11½-13 mm.

Hab. BURMA, Maymyo (*H. L. Andrewes*: v, vi, 1910).

Four specimens, the two forms captured on the same day and at the same locality. Very near *A. cyanurus* Hope, and still more variable in the colour of the elytra; the prothorax with an oval black spot on disc (as in some of the varieties of *A. trimaculatus* Hope); the terminal dorsal segment of ♂ very differently shaped.

Athemus trimaculatus Hope.

'Ruber, thorace rufo, elytrisque trimaculatis, apicibusque violaceis. Long lin. 5; lat. 1½.'

Telephorus trimaculatus Hope, in Gray's Zool. Misc. 1831, p. 26.

Telephorus coeruleomaculatus Koll. and Redt. in Hügel's Kaschmir, iv, p. 509, pl. 23, fig. 8 (1842).

Cantharis 4-cyaneomaculata Pic, Mélanges exot.-entom., xxi, p. 4 (1916).

Var. 1. 'Testaceus, thorace rubro elytrisque postice cyaneis. Long. lin. 5; lat. 1½.

Telephorus unipunctatus Hope, l.c.

Cantharis bicyaneomaculata Pic, l.c.

Var. 2. Elytra wholly nigro-caeruleous or violaceous, in some specimens (♀) greatly abbreviated and blunter at apex, leaving about three abdominal segments exposed.

♂. Eyes prominent; antennae extremely elongate, joint 2 very short, about one-third of the length of 3, 3 and 4 flattened beneath; prothorax gradually narrowed from base, longitudinally sulcate at middle; terminal (covered) ventral segment with narrow, rather long, converging lateral lobes, the corresponding dorsal segment divided into two long, feebly sinuate, spoon-shaped, strongly ciliate lobes; one of the tarsal claws angularly widened at base, the inner one of the anterior pair with a short tooth.

* In *Armidia* Muls., female, both the corresponding claws are sharply toothed.

♀. Broader; eyes smaller; antennae much shorter, joint 2 about half the length of 3; anterior and intermediate tarsi each with one of the claws armed with a straight thorn-like tooth near base, the tooth sometimes small.

Hab. Nepal, Sikkim, Kumaon (Almora, S. Garhwal, Haldwani, etc.), Bengal, Assam, etc.

A common, widely-distributed Indian insect, rufo-testaceous in colour, the elytra in the typical form having two nigro-caeruleous spots of variable size on each elytron, the basal spots sometimes confluent or wanting, the metallic colour rarely extending over the whole of their surface. In certain examples, especially ♂♂, the antennae, legs, some markings on the head, and one or three spots on the prothorax are infusate or black. The long series before me from Sikkim and Kumaon connect the various forms, males of two of which have been dissected for examination. A ♀ from Manipur is very like var. 2, but has smoother uneven elytra.

Athemus xanthogaster, n. sp.

♂. Elongate, narrow, finely pubescent, shining, the elytra (the humeri excepted) coriaceous and opaque; black, the abdomen flavo-testaceous; head closely, minutely, the prothorax sparsely, the elytra rugulosely, punctured, the last-named bicostate on disc. Head short, obliquely narrowed behind the eyes, the latter large and very prominent; antennae long, filiform, not very slender, joint 2 short, barely half the length of 3, 3-11 elongate. Prothorax about as long as broad, narrow, binodose on disc posteriorly, deeply sulcate down middle, and sinuously excavate on each side anteriorly, the raised lateral margins appearing sinuate from above. Elytra long, much wider than prothorax, narrowed posteriorly. Anterior tarsi with one claw bearing a straight tooth, and the other tarsi with one claw angularly dilated, at base. Terminal (covered) ventral segment with long, slender, porrect, lateral lobes, the corresponding dorsal segment divided into two broad spoon-shaped lobes.

♀. Eyes much smaller; antennae shorter; anterior and intermediate tarsi each with one claw toothed at base.

Length 8-9½ mm.

Hab. W. Almora [♂, type], Bhatkot and Sunderdhunga, all in Kumaon, alt. 4,000-10,000 ft. (*H.G.C.* : vi, 1919, v, 1920).

One ♂, two ♀♀. Recognisable by the entirely black coloration (the flavous abdomen excepted), long prothorax, opaque, bicostate elytra, the very large, prominent eyes in ♂, etc. The structure of the tarsal claws removes *A. xanthogaster* from *Podabrus* and *Anolisus*.

Athemus podabroides, n. sp.

♂. Elongate, narrow, finely pubescent, shining, the elytra coriaceous and opaque; black, the head in front, margins of prothorax, and apical and lateral margins of ventral segments, testaceous or rufescent; the head and prothorax very finely, the elytra rugulosely, punctured, the last-named obsoletely costate. Head (as seen exserted) rather long, obliquely narrowed behind the eyes, the

latter rather small; antennae long, filiform, joint 2 short, less than half the length of 3, 3-11 elongate. Prothorax narrow, longer than broad, slightly widened and strongly binodose posteriorly, deeply excavate at the sides anteriorly and sulcate down middle, the margins sinuate. Elytra long, flattened, narrowed posteriorly. Anterior and intermediate tarsi each with one claw bearing a slender straight tooth at base. Terminal (covered) ventral segment with moderately slender lateral lobes, the corresponding dorsal segment cleft.

Length $7\frac{1}{2}$ mm.

Hab. Sikkim, Rungbong Valley, Gopaldhara (*H. Stevens*).

One ♂. Separable from *A. xanthogaster* (♂) by the narrower, rufo-marginate prothorax, the small eyes, obsoletely costate, flattened elytra, the shorter lateral lobes of the terminal ventral segment, etc. The general facies is entirely that of a *Podabrus*.

CANTHARIS Linne (TELEPHORUS De Geer).

Of the few Indian species here referred to the old genus *Telephorus* (after the elimination of *Themus*, *Athemus*, *Discodon* and *Lycocerus*) only the first two are typical, the others doubtfully belonging to it.

Cantharis (Telephorus) biocellata Fairmaire

Telephorus biocellatus Fairm., Compt. Rend. Soc. Ent. Belg. xxxv, p. cxxx (1891).¹

Telephorus bipuncticollis Gorb., Ann. Soc. Ent. Belg. xxxix, p. 95 (1895).²

Var. *Cantharis flavonotata* Pic, Mélanges exot.-entom., xxxiii, p. 30 (1921) [♂ ♀].

♂. Antennae very long, filiform, joint 2 a little shorter than 3, elytra parallel, terminal (covered) ventral segment with slender lateral lobes, the corresponding dorsal segment entire; median lobe cleft at tip, the sac (as seen everted) simple in structure.

♀. Antennae much shorter; elytra broader and less parallel.

Hab. N. INDIA, Kashmir,¹ Chamba,² Kumaon up to Milam and Burphu, alt. 11,500 ft., on the Tibetan frontier (*H.G.C.*), N.W. Provinces (*ex coll. Andrewes*).

Sent me in abundance from Northern Kumaon, and a series from Kashmir (all immature or abraded) is contained in the Andrewes collection, A small form allied to the European *C. lateralis* L. and with the tarsal claws shaped as in that insect. The triangular occipital black spot sometimes extends across the base of the head, and the spots on the prothorax are rarely confluent; the elytra often have the scutellar region dilute testaceous (var. *flavonotata* Pic), the sculpture being rough and subgranulate. Males from Kashmir and Kumaon have been dissected for comparison. Found on *Euonymus* flowers (*H.G.C.*).

Cantharis (Telephorus) chumbiensis, n. sp.

♀. Elongate, moderately broad, shining, clothed with rather long whitish hairs; black, the basal joints of antennae in part, prothorax (an irregular, transverse, angulate patch on disc excepted), trochanters, and margins and apex of abdomen, rufous or tectaceous; the elytra brilliant metallic green; head and prothorax finely, the elytra rugosely, punctured. Head alutaceous, much narrower than prothorax, flattened anteriorly, the eyes small; antennae short, joints 2 and 3 equal in length, each a little shorter than those following. Prothorax strongly transverse, rounded at sides, canaliculate down middle, somewhat flattened laterally, the basal and apical margins reflexed. Elytra long, broader than prothorax, parallel. Seventh ventral segment with a long narrow notch in middle behind.

Length 9 mm.

Hab. TIBET, Chumbi, alt. 10,000 ft. (*Major Hingston*: ii, vi, 1924).

One ♀. This insect may be described as a diminutive form of *T. thibetanus* Gorh. (♂ and ♀ ♀ of which are before me), the types of which were captured at Tàtsiënloû; the eyes smaller, the elytra brilliant metallic green and strongly rugose. *T. oberthueri* Gorh., from the same Chinese locality, has a longer prothorax, costate elytra, etc.

Cantharis (Telephorus) granigera, n. sp.

♂. Elongate, narrow, shining, the elytra duller and coriaceous; black, thickly clothed with fine whitish or cinereous pubescence intermixed with long hairs which are setiform on the elytra; the head and prothorax closely, minutely, the elytra rugulosely, punctured, the last-named studded with small subseriately-arranged tubercles or granular elevations. Head somewhat convex along the middle anteriorly, obliquely narrowed behind the eyes, the latter prominent and rather large; antennae very long, filiform, joint 2 small, those following elongate. Prothorax longer than broad, gradually narrowing from base, excavate down the middle behind and hollowed towards the sides anteriorly. Elytra elongate, sub-parallel, wider than prothorax. Terminal (covered) ventral segment with a curved slender lateral lobe arising from each side of the concave inner edge of the emargination, the corresponding dorsal segment with spoon-shaped long lateral lobes. Tarsal claws widened at base.

♀. Antennae much shorter, joint 2 about half the length of 3; eyes smaller.

Var. Prothorax rufo-testaceous, a narrow streak in middle excepted. [♂ ♀.] Length 5½–6½ mm.

Hab. Sikkim, Singhik, alt. 5,000 ft. (*Major Hingston*: 24, iv, 1924).

Four ♂♂ and three ♀♀, both sexes represented in each form, and all labelled as captured on the same day and in the same locality. A small, narrow, black, cinereo-pubescent insect, with setose, tuberculate elytra, a form of sculpture not hitherto noticed by me amongst the Telephorids; the variety simply differs in the colour of the prothorax. This latter may be synonymous with *Rhagonycha (Absidia) multistriata* Pic (1906), from Sikkim, or one of its varieties from Darjeeling, named by the same author in 1924.

Cantharis (Telephorus) semiopaca Pic.

Cantharis (Telephorus) semiopaca Pic, Bull. Soc. Ent. Fr. 1909, p. 37.

Hab. Himalaya, Kulu (*Rost, type in coll. Pic: ♀?*), Burphu, N. Kumaon, alt. 11,500 ft. (*H.G.C.*).

A ♀ from Burphu, in the Gori Valley, near the Tibetan frontier, seems to belong to this species. A rufo-testaceous, shining, pubescent insect, length 9 mm., with subparallel, flattened, granulate, faintly costate, black elytra, the antennae (joints 1 and 2 excepted) and legs nigro-piceous; the head broad, hollowed between the eyes, the antennae filiform, the prothorax uneven, strongly transverse, subquadrate, with rounded angles. Compared by Pic with *C. biocellata* Fairm., a much smaller form, with a longer second joint to the antennae, etc.

Cantharis (Telephorus) specialithorax Pic.

Cantharis specialithorax Pic, Mélanges exot.-entom. xviii, p. 12 (1916).

'Elongatus, postice parum dilatatus, niger, supra purpureo pubescens; thorace subquadrato, in disco sulcato; elytris costulatis. Long. 10 mill.'

♂. Head short, narrower than prothorax, slightly hollowed between the eyes, the latter not very large; antennae very elongate, reaching to about apical third of elytra, rather stout, tapering towards tip, joint 2 very short, 3 nearly as long as 4; anterior tarsi with inner claw widened at base and armed with a short tooth, and the outer claw of the other tarsi angularly dilated at base; terminal (covered) ventral segment with a long, narrow, curved lobe on each side, a hook-like process also visible on each side of the median lobe, the corresponding dorsal segment with divided widely-separated lobes.

♀. Antennae much shorter; tarsal claws similar.

Hab. INDIA, Sikkim (*type of Pic*), Kumaon—Ranikhet, W. Almora, Gori Valley, Sunderdhunga, Pindar Valley, etc., up to 12,000 ft. (*H.G.C.*); TIBET, Chumba, alt. 10,000 ft. (*Major Hingston: vi, 1924*).

A common insect in Kumaon, varying from $6\frac{1}{2}$ -10 mm. in length, is apparently referable to this species. In fresh specimens the entire upper surface is covered with fiery-red or purplish pubescence, as in various Lycids, *Lycocerus*, etc. The prothorax is very short, broad and subquadrate, and the elytra are coriaceous and subcostate. Two ♂♂ have been dissected. Two allied forms, *C. bisbicostatus* and *bicoloripennis*, have been described by Pic (*Bull. Mus. Paris, 1924, p. 478*), both from Darjeeling.

DISCODON Gorham.

Discodon semiustum Gorham.

♀. *Telephorus semiustus* Gorh., P.Z.S. 1889, p. 99.

♀. *Themus aborensis* E. Oliv., Records Ind. Mus. viii, p. 120, fig. (1913).

Var. Elytra with basal margin only nigro-violaceous; head, antennae, femora (except at tip) and tibiae testaceous.

♂ ♀. *Telephorus* sp. (near *saleyeri*) Gorh., Ann. Soc. Ent. Belg. xxxix, p. 312 (1895).

♀ ? *Cantharis basipennis* Pic, L'Echange, xxiii, p. 173 (1907).

♂. Tarsal claws on all feet unequal, one shorter than the other and divided into two from near base, thus appearing stouter; antennae very elongate, joint 2 short, half the length of 3; seventh ventral segment cleft, the terminal (covered) one without lateral lobes, angulate in middle at tip, and with a long, narrow, apically-cleft process projecting from beneath the angulation, the corresponding dorsal segment with a short, broad, inwardly-curved, ciliate lobe on each side separated by a broad deep emargination; anterior tibiae slightly widened and shallowly sulcate along their inner face.

♀. Tarsal claws simple; antennae much shorter, joint 3 a little longer than 2.

Hab. INDIA (*Mus. Brit.*), Haldwani Division of Kumaon (*H.G.C.*: ♂ ♀), Abor Region, Sibsaurgor [type of *T. semiustus*], Assam, Burma [var.].

An insect similar in structure to *T. saleyeri* and *T. viridanus* Gorham, and other Malayan forms, one of which (*T. viridanus*) is said by him to correspond with his genus *Discodon*, two Indian species of which have been named by Pic. Males from Kumaon, Burma and the Philippines have been dissected, and they exhibit a very different armature of the terminal segments from that found in *Themus*, *Telephorus*, *Rhagonycha*, etc., the Philippine ♂ (?=*saleyeri* Gorh., var.) differing slightly from the others in this respect. The Burmese *C. basipennis* Pic seems to be a ♀ of the pallid variety. These insects agree with *Tyloderus* in having the prothorax transversely or obliquely plicate on each side near the base, and one of the ♂ tarsal claws of each foot cleft.

Discodon chloropterum, n. sp.

♂. Elongate, rather narrow, shining, closely cinereo-pubescent; black, the elytra metallic green; head and prothorax sparsely, minutely, the elytra rugosely, punctured. Head short, not so wide as the prothorax, the eyes moderately large and prominent; antennae very long, rather stout, joint 2 quite short, 3-11 elongate, sub-serrate. Prothorax strongly transverse, sub-quadrate, constricted at the middle, somewhat obliquely plicate at each angle, excavate down the centre posteriorly and also within the lateral margins, the hind angles obtuse. Elytra long, sub-parallel, broader than prothorax. Seventh ventral segment completely cleft down middle. Anterior and intermediate tarsi with one claw sleft at tip.

♀. Broader; antennae shorter, sub-filiform; eyes less prominent; seventh ventral segment entire, shallowly bifoveate; tarsal claws simple.

Length 5½-7 mm.

Hab. Nilgiri Hills (*H. L. Andrewes, T. V. Campbell*).

Seven ♂♂, five ♀♀. Allied to *D. (Themus) metallescens* and *subaenescens* Bourg. (1909) and *D. (Telephorus) stygianus* Gorh. (1889), differing from each of them in the very rugose metallic green elytra. The structure of the tarsal claws of the ♂, etc., separate these insects from *Silis*, *Themus*, *Cantharis*, etc.

SILIS Latreille.*

Silis biangulata, n. sp.

♂. Elongate, rather broad, shining, closely, finely cinereo-pubescent; piceous, the head in front, the lateral and basal margins of prothorax (the dentiform prominences excepted), and knees testaceous; the head and prothorax closely, extremely minutely, the elytra rugulose, punctured, the last-named feebly sub-costate. Head narrower than prothorax, the eyes rather large and prominent; antennae very long, strongly pectinate. Prothorax short, rounded anteriorly, sulcate down the middle behind, biangularly dilated on each side before the deep basal constriction, the latero-posterior prominence dentiform, the hind angles acute. Elytra wider than prothorax, slightly narrowed towards apex.

♀. Antennae about as long as in ♂, sharply serrate; prothorax feebly sinuate and somewhat rounded at sides, less constricted posteriorly, the hind angles acute.

Length 6-7 mm.

Hab. Anamalai Hills (*H. L. Andrewes*).

One ♂, three ♀♀. Intermediate in size between *S. maindromi* Bourg. and *S. ramifera*, infra, the prothorax with the basal and lateral margins testaceous, the lateral armature of ♂ dissimilar.

Silis ramifera, n. sp.

♂. Elongate, pubescent, shining; black, the mandibles testaceous; the head and prothorax closely, minutely, the elytra rugosely, punctured. Head much narrower than prothorax, the eyes rather large; antennae long, strongly pectinate from joint 3 onward, each ramus longer than the joint from which it arises. Prothorax strongly transverse, convex, sulcate down middle, arcuately dilated on each side posteriorly and with a deep fovea within the broad curved hind angles of the dilated portion, the basal constriction also deep. Elytra long, parallel, not wider than prothorax. Legs slender; tarsal claws angularly dilated in their basal half.

♀. Eyes smaller; antennae shorter, serrate; prothorax simply grooved on each side in front of the hind angles, the latter acute.

Length 4½-5 mm.

Hab. Sikkim, Gopaldhara (*H. Stevens*: ♂♀), Nurbong (*W. K. Webb*: ♂).

Three ♂♂ (one immature) and two ♀♀. A small black form, with pectinate antennae in ♂, related to the Japanese *S. pectinata* Lewis, which has a broader head and the prothorax testaceous,

* *Silis* (?) *notaticollis* Gorh (1895), from Kanara, to judge from the description, is a *Stenothemus* (male), with nigro-fuscous elytra, and almost certainly = *S. picticollis* Bourg. (1907), a fairly common insect in the Nilgiris. *S. palisiana* Champ (1924) has been received from Shembaganur, Kodaikanal and Trichinopoly, S. India; it differs from *S. elongata* Pic (1905) in the pectinate (not flabellate) antennae in male.

with the hind angles less produced posteriorly.* There also is a ♂ of an allied unnamed Indian form in the British Museum (ex coll. Sharp) too imperfect to describe.

Silis nodosicornis, n. sp.

♂. Elongate, narrow, finely pubescent, shining; testaceous, the eyes and the antennal joints 3-8 or 3-9 piceous or black; the head and prothorax sparsely, minutely, the elytra rugosely, punctured. Head broad, the eyes large; antennae long, tapering towards tip, joint 2 short, 3-11 sub-equal in length, 3-8 much thickened, sub-serrate, each tumid at the outer apical angle, 9-11 narrower. Prothorax transverse, about as wide as the head, sulcate down the centre, armed on each side behind the middle with a short, stout, backwardly-directed acute tooth. Elytra elongate, parallel, very little wider than prothorax. Anterior femora slightly curved; anterior tibiae bowed and compressed at base.

♀. Eyes smaller; antennae black (except at base and tip), equally elongate, more slender, sub-filiform; prothorax with the sides rounded, feebly sinuate anteriorly.

Length 6-6½ mm.

Hab. Nilgiri Hills (*H. L. Andrewes*).

Six ♂♂, two ♀♀. Extremely like *S. simplex* Gorh. (re-described by him from Indian specimens in 1895), males of which from Kanara and Borneo are before me; but separable therefrom by the nodose intermediate joints of the antennae (these organs being filiform in the same sex of *S. simplex*), and the basally-compressed anterior tibiae, of the ♂. *S. simplex* usually has the intermediate joints of the antennae more or less infusate.

Silis latimanus, n. sp.

♂. Elongate, narrow, finely pubescent, shining; testaceous, the eyes, antennae (except joints 1 and 2), wings and abdomen infusate or black; the head and prothorax very sparsely, minutely, the elytra rugulosely, punctured. Head broad, obliquely narrowed behind the eyes, the latter prominent and moderately large; antennae long, tapering, joints 3-11 widened, gradually becoming shorter, 7-11 narrowing outwards, 11 about as long as 2. Prothorax strongly transverse, armed on each side with a long, stout, oblique tooth. Elytra elongate. Anterior tibiae abruptly widened from near the base, flattened beneath.

♀. Antennae longer, filiform, joints 3-11 equal in length; prothorax rounded at the sides.

Length 7-8 mm.

Hab. Anamalai Hills (*H. L. Andrewes*).

One ♂, two ♀♀. This is another form of *S. simplex* Gorh., with a more transverse prothorax and the antennae tapering, shorter and stouter, and the anterior tibiae widened from the base, in ♂. The more elongate antennae in the ♀ is an unusual character. *S. nodosicornis*, from the Nilgiris, also comes very near the present species.

* *Laemoglyptus subspinosus* Pic (1911), type male, from Formosa, an insect with flabellate antennae and a red prothorax, is a *Silis* closely related to the Japanese *S. pectinata* Lewis. There is a similarly-coloured form of *S. maindroni* Bourg. in the Nilgiris, as well as one with a black prothorax.

Silis ochraceipennis, n. sp.

♂. Moderately elongate, robust, densely ochraceo-pubescent; rufous, the elytra ochraceous, the eyes, antennae (the flavous apical two or three joints excepted), legs, and under-surface black; the head and prothorax closely, minutely, the elytra densely, rugulose punctured. Head (with the large prominent eyes) nearly as broad as prothorax; antennae long, stout, tapering towards tip, joints 3-11 sub-equal in length. Prothorax strongly transverse, bidentate laterally, the anterior tooth oblique, sharp, the one nearer the base short, obtuse. Elytra rather broad, parallel. Tarsal claws angularly widened in their basal half, one of those of the anterior and intermediate pairs feebly bicuspid at tip and a little stouter than the other.

♀. Eyes smaller; antennae a little shorter and stouter; prothorax with the lateral margins rounded, hollowed towards anterior angles, and notched in front of the posterior ones.

Length $6\frac{1}{2}$ - $7\frac{1}{2}$ mm.

Hab. Nilgiri Hills alt. 3,500 ft. (*H. L. Andrewes*).

Two males and three females. This insect seems to be an ally of *S. sanguinea* Pic (*Mélanges exot.-entom.*, xxxiii, p. 28, 1921), from Madura, differing from the diagnosis of that insect in the black legs and under surface, and the yellow apical two or three joints to the antennae.

Silis fruhstorferi Pic.

♂. *Silis fruhstorferi* Pic, L'Echange, xxii, p. 91 (1906).

♂. Antennae very elongate, stout, sub-serrate; prothorax constricted at middle, with a broad sub-rectangulate lamella arising on each side from beneath the margin posteriorly, a long, backwardly-directed, slender, flexible process projecting from beneath the point of constriction, and an acute rigid tooth at each hind angle; lateral lobes of terminal abdominal segment (as seen drawn out, from above) very long, narrow, dilated into an oval plate distally, and each furnished at apex with two long slender acute teeth.

♀. Antennae much shorter, scarcely reaching the middle of elytra, more slender, feebly serrate; prothorax sinuate at sides, widened before the base.

Length 5- $5\frac{1}{2}$ mm.

Hab. Sikkim (*type of Pic*, ♂), Gopaldhara (*H. Stevens*: ♂ ♀), Kurseong (*Mus. Brit.*: ♂ ♀).

Seven ♂♂ and four ♀♀ of this species are before me. A short, robust, broad, shining black insect, with the prothorax rufous (a transverse patch or two spots on the disc excepted), the elytra coarsely punctured, the ♂ with a peculiarly-shaped prothorax and a remarkable sexual armature.

Silis fuscitarsis Gorham.

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♂. *Silis fuscitarsis* Gorh., *Ann. Soc. Ent. Belg.* xxxix, p. 314 (1895) (part.).

♂. Head broad, eyes prominent; antennae long, stout, filiform, joints 9 and 10 compressed, dilated, closely articulated; prothorax armed on each side with a short, narrow, backwardly-directed tooth towards the base, sub-angularly dilated behind this (leaving a narrow lateral notch), and constricted

in front of the hind angles; anterior tibiae bowed; ventral segment 6 deeply cleft; tarsal claws angularly dilated in their basal half, one of those of the anterior and intermediate pairs slightly notched at tip and a little stouter than the other.

Var. ♂. Antennae simple.

Length 5-6 mm.

Hab. INDIA, Bengal, Surda (*F.W.C.* : ♂), Gopaldhara, Sikkim (*H. Stevens* : ♂); BURMA, Tharrawaddy (type : ♂), Rangoon.

A small, shining, testaceous form, with the elytra wholly (or except at base or shoulders) black, and the antennae usually (except joints 1 and 2) and the tarsi in part fuscous. Some of the Rangoon specimens quoted by Gorham (two of which are before me) cannot be included under the same species. Numerous examples (♂ ♀) from Manipur, Patkai Mts., Assam (*ex coll. Fry*), Sylhet, etc., with antennae simple or as in type in ♂, must belong here.

Silis obscuritarsis Pic.

♂. *Silis obscuritarsis* Pic, Bull. Soc. Ent. Fr. 1907, p. 195.

♂. Head broad, rather large; antennae long, filiform, comparatively stout, joint 10 widened, oblongo-quadrate, compressed and obliquely articulated to the preceding joint; prothorax short, constricted behind the anterior angles and armed with a short, stout, blunt, backwardly-directed tooth on each side towards the base; ventral segment 6 deeply cleft; tarsal claws angularly dilated in their basal half.

♀. Head and eyes smaller; antennae a little more slender, simple; prothorax rounded at sides, obliquely narrowed posteriorly and constricted anteriorly.

Var. ♂. Antennae simple.

Var. Antennae, tarsi, and in one specimen the abdomen also, testaceous. (♀.)

Length 6-7½ mm.

Hab. Kulu, Himalaya (type of ♂), W. and Central Almora, Ranikhet, and Ramganga, Sarju and Gori Valleys, all in Kumaon (*H.G.C.*), Buxar Duars [♂] and Kurseong [var. ♀] (*Mus Brit.*).

Apparently a common insect in Kumaon. An elongate, shining, rufo-testaceous form, with the antennae (joints 1 and 2 excepted), eyes, elytra, and abdomen in part, black, the tarsi usually more or less infuscate, the elytra becoming rugose towards the apex. *S. fuscitarsis* Gorh., from Burma, etc., is an allied form with the antennal joints 9 and 10 usually dilated, compressed and closely articulated in ♂.

Silis bicolorimembris Pic.

♂. *Silis bicolorimembris* Pic, Mélanges exot.-entom. xxxvii, p. 1 (November, 1922)?

♂. Larger and more elongate than *S. fuscitarsis* Gorh.; testaceous, shining, pubescent, the antennae (except joints 1 and 2), eyes, elytra, abdomen, tarsi and apices of tibiae black or infuscate; the head and prothorax very

sparsely, the elytra closely, rugulosely, punctulate. Head broad; eyes large, prominent; antennae long, filiform, rather slender, joints 9 and 10 not in the least thickened. Prothorax as in *S. fuscitarsis*, the oblique lateral tooth short. Elytra elongate. Anterior tibiae not bowed. Tarsal claws as in *S. fuscitarsis*.

♀. Head and eyes smaller; antennae shorter; prothorax obliquely and sinuously narrowed before and behind the middle; abdomen and tibiae testaceous.

Length $7\frac{1}{2}$ –8 mm.

Hab. INDES (type of Pic); BURMA, Rangoon (ex coll. Atkinson).

The pair here described may or may not be referable to the insect briefly diagnosed by Pic in 1922. It is said to differ from *S. fuscitarsis* Gorh. in having wholly black elytra, though Gorham gives 'elytris nigris' for his species!

Silis unilamellata, n. sp.

♂. Elongate, somewhat robust, pubescent, shining; testaceous, the antennae (joints 1 and 2 excepted), eyes and elytra (the humeri excepted) black, the tarsal joints 2 and 3 infuscate; the head and prothorax sparsely, obsoletely, the elytra closely, rugulosely, punctured. Head moderately broad; eyes prominent, rather large; antennae long, stout, filiform, joint 9 a little shorter than 8, 10 dilated, longer than 9, excavate and closely pubescent beneath. Prothorax short, armed on each side with a long, slender, backwardly-directed tooth followed by a prominent angular dilatation (leaving a deep narrow lateral notch). Elytra elongate, much wider than prothorax. Anterior tibiae feebly curved.

Length $7\frac{1}{2}$ mm

Hab. INDIA, Buxar Duars (ex coll. Andrewes).

One example. This is another form of *S. fuscitarsis* Gorh., with broader elytra, and the tenth joint only of the antennae abnormally dilated in ♂, the humeri testaceous, as in one of the varieties of that species. A ♂ of *S. obscuritarsis* Pic was also found at the same locality. *S. singularicornis* Pic (1924), from Darjeeling (type ♂), has very similar antennae, but wants the long prothoracic tooth, which is shaped as in *S. birmanicus* Pic (1911).

MALTHINUS Latreille.

Malthinus spissicornis, n. sp.

♂. Elongate, robust, narrow, shining, very sparsely, finely pubescent; testaceous, the antennae (except joint 1 beneath), terminal joint of each palpus, eyes, tibiae and tarsi black, the elytra whitish; the head and prothorax almost smooth, the elytra closely impressed with rather coarse punctures, with minute punctures intermixed, the larger ones subseriately arranged on disc. Head short, the eyes prominent; apical joint of labial and maxillary palpi stout, ovate; mandibles sharply toothed within; antennae stout, somewhat dilated, very elongate, as long as or longer than body, joint 2 a little shorter than 3, 4 hollowed on its inner aspect. Prothorax transversely sub-quadrate, sinuate at sides, uneven on disc. Elytra elongate, narrowing from a little below base, much wider at base than prothorax. Legs stout; tarsal claws slender.

Length $5\frac{1}{2}$ –6 $\frac{1}{2}$ mm.

Hab. Upper Gumti Valley, W. Almora, alt. 6,000 ft., and Haldwani Division of Kumaon (*H.G.C.* : iv, 1919, iii, 1923).

Three ♂♂. Recognizable by its stout build, the very long, thickened black antennae, and the black tibiae and tarsi. Till the mouth-parts are examined this insect might be mistaken for a *Telephorus*.

Malthinus duplolineatus, n. sp.

♀. Elongate, slender, shining, sparsely, finely pubescent; testaceous, the elytra whitish, the head with an oblique streak on each side at base, eyes, antennae (except joints 1-3 beneath), and two sinuous lines on the disc of prothorax, black; the head and prothorax almost smooth, the elytra rather coarsely sub-seriate-punctate, the puncturing becoming confused towards sides and apex. Head broader than prothorax, convex, obliquely narrowed and well-developed behind eyes, the latter small; antennae filiform, very slender, about reaching the middle of elytra, joint 2 nearly as long as 3. Prothorax uneven, sub-quadrate. Elytra long, wider than prothorax, sub-parallel. Legs slender.

Var. Head and prothorax (except at anterior angles beneath) immaculate, the tibiae slightly infusate.

Length $4\frac{1}{2}$ mm.

Hab. W. Almora Division of Kumaon [type] (*H.G.C.* : v, 1917, v, 1919), Chamba (*Mus. Brit.*).

Three ♀♀, two of them immature and immaculate. The type is separable from *M. lineatocollis* Champ. (♀), of the same region, by the much smoother, bimaculate head, the bilineate prothorax, and the much more elongate, infusate antennae. The southern *M. stramineus* Champ. has a larger, immaculate head, a non-lineate prothorax, and short, obsoletely punctulate elytra. *M. sikkimensis* Pic (1924), from Darjeeling, has black elytra.

Malthinus 4-nodosus, n. sp.

Elongate, narrow, slender, finely pubescent, alutaceous, the elytra shining; black, the mandibles and palpi in part testaceous, the antennae and legs piceous; the head and prothorax closely, very minutely, the elytra more strongly, confusedly, punctured. Head narrower than and about as long as prothorax, gradually narrowed behind the eyes, the latter small; antennae filiform, not very slender, long, joint 2 shorter than 3; mandibles stout, toothed towards ap, the apical portion slender; terminal joint of palpi sub-securiform. Prothorax transverse, sub-quadrate, strongly constricted at middle, appearing nodose at each angle, obliquely plicate in front of each hind one, and sulcate down the centre posteriorly. Elytra long, parallel, about as wide as prothorax, covering the abdomen. Legs rather slender.

Length $4\frac{1}{2}$ mm. (♀?).

Hab. TIBET, Rongshar Valley, alt. 10,000 ft. (*Major Hingston* : 26, vi, 1924).

One specimen. The mesially-constricted, quadrinodose, sub-quadrate prothorax, long elytra, black body, etc., separate this species from the described members of the genus.

P.S.—Pic's paper on various Malacoderms captured at Darjeeling by Harmand [Bull. Mus. Paris, 1924, pp. 477-482] was overlooked by me when my Telephorid-paper (19) was published in May and June last (antea, pp. 118-137). *Podabrus annulicornis* Champ. is perhaps a form of *P. lineolatus* Pic, and *Anolisus hieroglyphicus* Champ. may be a small variety of *P. inaequalis* Pic; but till types can be compared, they are best treated as distinct.

ON THE INDUCTION OF MELANISM IN LEPIDOPTERA.

BY F. C. GARRETT, D.SC., AND J. W. HESLOP HARRISON, D.SC., F.R.S.E.

Mr. G. T. Porritt has studied Melanism in the field for so many years that anything he writes on the subject deserves careful consideration, and we have read his contribution to the May number of this magazine with interest, though we are sorry to find that he has misunderstood the paper he criticises. No doubt the fault is ours: we have failed to make our point of view sufficiently clear, and although we have no desire to engage in any controversy it seems desirable to clear away a certain amount of misunderstanding. Mr. Porritt has not realised that our work was intended as a contribution to the science of Genetics; the paper being written for the information of geneticists, entomological matters were only dealt with incidentally, and the subject was not handled as it would have been if we had been addressing an audience of Entomologists.

Our critic seems to believe that we hold that melanism is always associated with Industrialism and, further, that by our experiments we have solved the whole problem. On the contrary, we know quite well that the phenomenon is noticeable in districts far from any industrial centre, and have discussed such cases at some length in the Journal of Genetics (Vol. IX, 1920). Furthermore, we share his opinion that 'there may possibly be more than one cause of the phenomenon,' though we should use a more emphatic word than 'possibly.' Our position is simple enough. All who have studied the subject, including Mr. Porritt (p. 110), agree that there is a connection between smoke and melanism; we have shown that when certain metallic salts are added to the food of certain larvae melanism is produced, and as one, at least, of these metals occur commonly in soot, it is reasonable to conclude that it has the same effect in nature as in the laboratory—that manganese is one cause of melanism in nature. Mr. Porritt asks how it is that 'if *S. bilunaria* is so readily susceptible to the melanic influence as the authors claim to have proved'—though we have made no such claim—melanic specimens have never been

taken in nature ; and we have to make a correction. In our paper we stated that no such specimens had occurred, but Dr. E. A. Cockayne has kindly told us that there were in the Horne collection three specimens very like ours, which were reared from eggs laid by a wild female taken in the West Riding of Yorkshire, and this information of course strengthens our case. Mr. Mansbridge's interesting moths cannot well be discussed until he has published a full account of his work, although a very simple explanation suggests itself.

Mr. Porritt propounds a number of conundrums and anomalies, and the list could be lengthened to any extent ; is he right though in describing *thulensis* as 'the melanic male variety' of *Hepialus humuli*? We do not claim to be able to explain every case as yet, for a vast amount of experimental work must be undertaken before that can be done ; there is room for a hundred workers, and we are but two. But we do believe that we have found a clue which will lead, if followed patiently, to the solution of all the problems of Melanism. What is needed is not argument but experiment !

Wallis Club, Newcastle upon Tyne.

June 26th, 1926.

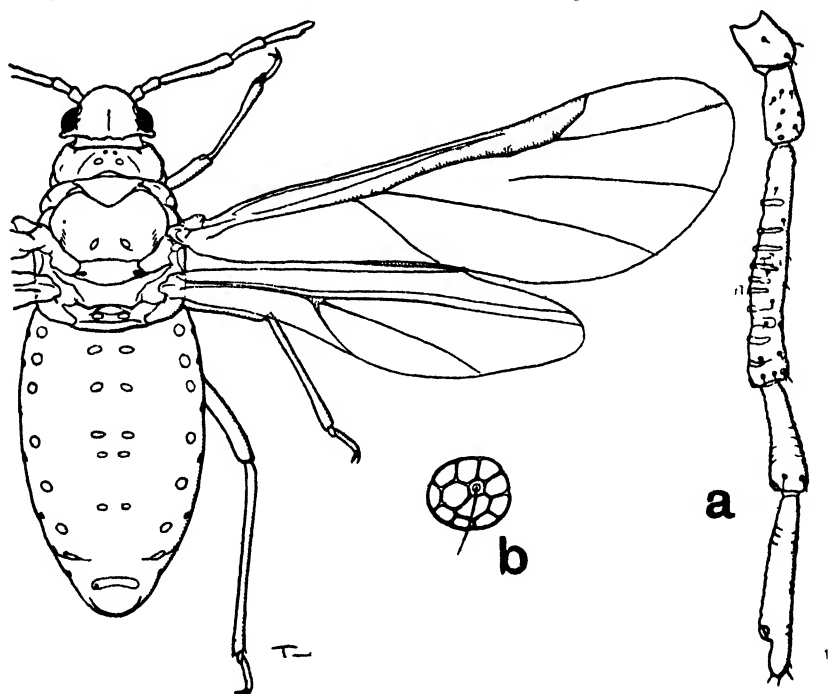
THE ALATE FEMALE OF THE *AURICULA* APHID.

BY F. LAING, M.A., B.SC.

My intention at present is simply to describe and figure the alate female of this species. Its specific name is still in doubt, for though I have shown [Ent. Monthly Mag. (3), ix, 1923, p. 245] that it was what Buckton described as *Rhizobius graminis* Pass., it may not be the species known under that name on the Continent, and it is certainly not what Theobald has recorded as such from Kent and Egypt. The species belonging to this complex are so badly defined that for the present it is convenient to treat it as *auriculæ* Murray ; but in view of its wide distribution in this country on a range of plants comprising the roots of various grasses, Spruce, *Auricula* and *Primula*, it is probably equally widely distributed on the Continent and known there under a much earlier name than that of Murray's. Its generic disposition is also uncertain, for though I had assigned it to *Geioica* with hesitation, having only the apterous form before me, it is obvious that it cannot belong here, for that genus has 6-segmented antennae in the alate female. It might be placed in *Forda*, but the presence of such a well-developed gland-system in both forms, and the slightly different type of sensoriation on the third antennal segment in the alate female compared with that of *formicaria* Heyd.,

the genotype of *Forda*, precludes, in my opinion, such a placing, and I prefer to resuscitate for its reception *Pentaphis* Horv., which Baker has sunk as a synonym of *Forda* and transferred to the latter *marginata* Koch and *trivialis* Pass. These insects may be congeneric with the species under consideration, as is probably also *pawlowae* Mdv.

Alate Viviparous Female. Antennae very dark green, 5-segmented, III with about ten narrow, linear, transverse sensoria, segments in the proportion of 4, 5, 16, 7 (10+2), total length 0.8mm.; head dark, almost black; prothorax green; meso- and meta-thorax black, greenish laterally; legs dark brown except the base of the femora and the coxae, which are glass green; abdomen grass green with the anal plate dark brown; cornicles absent; forewings with the media simple and much fainter than the remaining veins, but clearly distinct; hindwings with the veins normal. Glands distributed as follows: a median pair on the prothorax, another pair medianly-posteriorly on mesothorax, a pair on the metathorax, five median pairs and seven lateral pairs on the abdomen and a large single transverse gland immediately in front of cauda; each gland faceted and with a single seta arising from near the centre, the transverse pre-caudal gland with two such setae and composed, therefore, apparently of two fused glands. Metascutellum also minutely faceted. Hind tarsi subequal to length of fourth antennal segment. Total length 2.5 mm.



Pentaphis auriculae (Murray), alate ♀; a antennae, b type of gland.

Surrey, Royal Hort. Soc. Gardens, Wisley (G. Fox-Wilson),
on *Primula pedemontana*.

British Museum (Nat. History),
Cromwell Road, S.W.
July, 1926.

NOTES ON THE EMPIDIDAE (DIPTERA) WITH ADDITIONS AND
CORRECTIONS TO THE BRITISH LIST.

BY J. E. COLLIN, F.E.S.

(Continued from p. 190.)

TRICHINA Meig.

, *T. bilobata*, n. sp. ♂. Differs from *clavipes* and agrees with *elongata* in having the front margin of thoracic disc slightly dulled with microscopic pubescence. Differs from *elongata* in having the antennal style quite half the length of third antennal joint and the left lamella of male genitalia with two projecting lobes. In *elongata* the antennal style is not half the length of third antennal joint and the left lamella has only one short projecting process.

I possess this species from Scotland—Golspie (Sutherland) and Aviemore (Inverness)—and Wales—Porthcawl (Glamorgan), while the late Dr. J. H. Wood found it in Herefordshire, and specimens occurred in Kowarz' Collection from Central Europe.

Additional British species to this genus are : *opaca* Lw., added to the 'List' by Verrall in 1911 (Ent. Mo. Mag., p. 79), and the following :—

T. pallipes Zett. A species remarkable for the fact that the arista is compressed and deep—of equal depth to the end of third antennal joint—making this third joint appear to be very long. It was described by Zetterstedt as an *Oedala*.

A single female was taken by the late Mr. Verrall at Dolgelly (Merioneth) on July 25th, 1888.

OEDALEA Meig.

Oe. zetterstedti, n. sp., ♂ ♀. Resembling *holmgreni* in structure of antennae and in having the hind femora at most only slightly dusky towards tip, differing in having the halteres paler, abdomen of male not so dull on disc and with longer pubescence, and hind coxae and trochanters yellow. Thoracic and scutellar bristles dark.

This is the *Oe. holmgreni* of Lundbeck and of Kowarz' Collection, and probably of Loew, but not the same as the type specimen of *holmgreni* in the Swedish General Collection at Stockholm. It is not uncommon in Scotland (Nethy Bridge, Aviemore, Dingwall, Nairn) in June, and appears to have a more northern range than *holmgreni*.

Additional British species are *apicalis* Lw., added to 'List' by Verrall (Ent. Mo. Mag., 1911, p. 79), and the following :—

Oe. tibialis Macq. A small species (length 2.5–3 mm.) with antennal style stout but very short, sharp-pointed and not easy to distinguish from end of third joint. Thoracic and scutellar bristles yellow. Legs all yellow except the hind tibiae.

I have caught this species in Cambridgeshire (Chippenham and Woodditton Wood) in June, and at Moccas Pool, Hereford, in

August. Dr. Sharp and Mr. C. G. Lamb have taken it in the New Forest (Hants) in June. It is certainly distinct from *flavipes*.

EUTHYNEURA Macq.

E. halidayi, n. sp., ♀. Resembling *myrtilli*, but hind femora beneath at tip with a few small spinose bristles and tiny 'points' which are never present in *myrtilli*, for though the anteroventral bristly hairs are a little longer towards tip in *myrtilli* they are never spinose. The tiny thoracic pubescence paler than in *myrtilli*—almost whitish—and the scutellar bristles paler (yellowish to yellow-brown).

Odd specimens have been taken at Bettws-y-Coed (Carnarvon), Chiddingfold (Sussex) and Aviemore (Inverness). The late Mr. F. Jenkinson caught two specimens on the windows of his house at Cambridge, and Col. C. G. Nurse found an example at Timworth (Suffolk). It occurs in May and June. The specimen of *E. myrtilli* in Haliday's Collection at Dublin is not true *myrtilli* Macq., but the species described above with the spinose hind femora. *E. consobrina* Zett. and *E. rostrata* Zett. are both synonyms of *myrtilli* Macq.

E. gyllenhali Zett. Easily recognised by the brownish band across the middle of wing. The stigma is darker and the band which extends from tip of mediastinal vein to end of stigma and downwards to below discal cell becomes fainter as it extends downwards. The proboscis is shorter than in *myrtilli* and the hairs and bristles on thorax and scutellum are pale.

I have seen only two females of this species, both taken by Mr. F. W. Edwards at Pateley (Yorkshire) on June 24th, 1924.

HORMOPEZA Zett.

H. obliterated Zett. This rare species was added to the List in 1918 (Ent. Mo. Mag., p. 278).

OROPEZELLA n.g.

Certain species of *Leptopeza*, of which *sphenoptera* Lw. (added to List by Verrall in Ent. Mo. Mag., 1911, p. 79, and 1912, p. 26) may be taken as typical, exhibit such a marked difference in the position of antennae and the shape of the wings as to make it advisable to separate them generically. The antennae are situated much above the middle of head, the eyes in both sexes touching for a long space below the antennae and narrowly separated on the short frons. Wings with the axillary angle not developed.

MICROPHORUS Macq.

M. velutinus Macq., of the 'List,' must in future be known as *M. holosericeus* Meig., and *M. crassipes* Macq. may rank as a

good and distinct species distinguished from *anomalus* Meig. by its less dull thorax in the male, and less numerous long, straggling bristles on male belly. The female has a rather longer labrum than in *anomalus*, the thorax is not quite so dull and the dorso-central bristles are not so numerous, being uniserial in front and behind and biserial about the middle. It appears to be more common than *anomalus* and occurs a little later than the equally common *holosericeus*.

Subf. EMPIDINÆ.

RHAMPHOMYIA Meig.

The first serious attempt to split up this genus into subgenera was made by R. Frey in 1909 (Act. Soc. Fenn. xxxi, No. 9, p. 17); this attempt he further elaborated in 1922 (Notul. Ent. II), where he proposed the subgeneric names of *Lundstroemiella*, with type *hybotina*; *Choreodromia*, type *nigripes*; *Pararhamphomyia*, type *plumipes* (= *geniculata*); *Dasyrhamphomyia*, type *vesiculosa*; and retained *Holoclera* Schin. for *nigripennis* and its allies and *Rhamphomyia* Meig. with type *sulcata* Meig. Of these names *Choreodromia* must certainly sink as a synonym of *Megacyttarus* Bigot.

There are certain characters, apparently of considerable value in indicating groups of allied species, which Frey has not made use of; for instance, the anal vein fades away before reaching the wing margin in *Megacyttarus*, it is faint about its middle (especially from some points of view) in *Pararhamphomyia*, while it is complete in *Dasyrhamphomyia* and *Rhamphomyia*; further, the arrangement of hairs or bristles on the various parts of the prothorax has some value, especially the presence or absence of such hairs on the episterna (a sclerite at the side, between the condyle of the neck and the prothoracic stigmata, and which has the 'collar' of the neck above and somewhat in front of it, and the sides of prothoracic sternum below it); in *Megacyttarus* and usually in *Pararhamphomyia* this episterna is quite bare; in *Pararhamphomyia* the sides of prothoracic sternum often bear only 1-2 hairs; in the species immediately allied to *sulcata*, and in *coracina* and *pokoryni*, the prothoracic sternum is hairy all over, even down between the front coxae.

Two other groups are certainly sufficiently differentiated to be worthy of a name. One includes *erythrophthalma* Mg. (*serotina* Oldenb.), *hirsutipes* n. sp., *crassicauda* Strobl, *gibba* Fall., *pseudogibba* Strobl and *bipila* Strobl. It is distinguished by an

elongate discal cell with the vein forming its upper margin very indistinct, often only visible as a slight depression on wing surface. I give it the name of **Amydroneura** (type *erythrophthalma* Meig.) The other group is primarily distinguished by the long, narrow and very short-haired labella of the proboscis, quite different from the labella of other species of *Rhamphomyia* and much more like that of *Empis*. The species of this group further differ from any Rhamphomyid which has hairs on both the side of the prosternum and on the episterna of prothorax, in having no distinct bristle in the 'comb' at tip of hind tibiae behind. The group shows relationship to the restricted genus *Empis* in many ways, and specimens occasionally occur with indications of a fork to the cubital vein. I propose the name of **Aclonempis** for this group, with *albohirta* n. sp. as type, other species of the group being *eupterota* Lw., *galactoptera* Strobl, *umbripes* Beck., *longipes* Meig., *nox* Oldenb. and *minor* Oldenb. Of these, *longipes* Mg. is the only other species known to occur in Britain, and is not uncommon at any rate in the South. It is a small, shining, black species, with dark abdominal pubescence consequently quite distinct from the other British species of this group (*albohirta*).

Subg. PARARHAMPHOMYIA Frey.

R. murina, n. sp., ♂ ♀. Closely resembling *albipennis*. Thorax rather darker grey and slightly more shining. Male with longer hind-marginal bristles on last abdominal sternite, upper lamellae of hypopygium less hairy and when viewed from above with a distinct tiny comb of minute black spines on the inner margin at middle. Female resembling the male. Wings more distinctly darkened than in *albipennis*, which it otherwise resembles.

Length 2.5-3 mm.

Five males and two females. Aviemore (Inverness), June 1st and 2nd, 1913.

R. albitarsis, n. sp., ♂ ♀. Dark dove-grey species with faint brown stripes down lines of bristles on thorax. Acrostichals irregularly bi-serial, dorso-centrals bi- to tri-serial. Male with the knees and the base of all tarsi (almost the whole of hind tarsi) yellowish-white, hind tibiae very slender, hypopygium small but penis very long and slender projecting (with a slight wave at base) for more than double the length of side lamellae then re-curved and coming straight back to upper lamellae. Female with simple legs having only the knees pale. Hind femora with some anterodorsal bristles near tip.

Length 3.25 mm.

Several specimens. Aviemore (Inverness), Barton Mills (Suffolk), Trumpet Wood (Hereford). End of May and beginning of June.

R. micropyga, n. sp., ♂ ♀. Shining black species. Thorax most shining down the rows of bristles. Acrostichals and dorsocentrals short and fine, the former bi-serial, the latter irregularly bi- to tri-serial. Male with very small hypopygium, side lamellae narrow, upper lamellae shorter than side lamellae, penis stout with only basal half visible; abdominal pubescence dark. Legs shining black, anterior tibiae almost devoid of bristles, hind femora clothed beneath with whitish pile and only anteroventrally with a few quite short black bristles. Female with hind femora beneath, hind tibiae above and first two joints of hind tarsi above, distinctly pennate. Halteres pale.

Length 3-4 mm.

Rannoch (Perth), Aviemore (Inverness), Stoke Wood (Hereford). May and June.

Subg. RHAMPHOMYIA Meig.

R. sulcatella, n. sp., ♂ ♀. Resembling *sulcata*, but male with the upper lamellae more truncate behind in profile, and when viewed from behind each with only one rounded projection on middle third. Abdomen greyer. Front femora with short bristles beneath towards tip. Female differing from *sulcata* in having the four posterior femora and the hind tibiae more ciliated. Abdominal pubescence more distinct. Costal ciliation of wings longer in both sexes.

Length 6-7 mm.

Numerous specimens. Chippenham Fen (Cambs), Wood Walton Fen (Hunts). End of April and beginning of May.

This is the *R. sulcata* of Meijere (Tijd. v. Ent. 1918, p. 135), my *sulcata* being his new species *propinqua*. I cannot, however, agree with Meijere in his restriction of the name *sulcata*. In Meigen's Collection at Paris there are three specimens under the name *sulcata*, a male which is *R. cinerascens*, a female of my *sulcata* (*propinqua* Meij.) and a female with a label 'Env. de Paris,' almost certainly a specimen received by Meigen from Macquart long after he described his *sulcata*, this is my *sulcatella* (*sulcata* Meij.). In considering this matter some years ago, I decided on the first female as the 'type' of *sulcata* Meig., partly because it appeared to represent the commonest species and partly because it was the species chiefly represented in Zetterstedt's Collection as *sulcata*, in which Collection *sulcatella* is not to be found. In any case *propinqua* Meij. sinks as a synonym either of *sulcata* as restricted by me or of *rugicollis* Meig., the type of which (a male in the Paris Museum) is the same species as my *sulcata*.

R. sulcatina, n. sp., ♂ ♀. Resembling *sulcata* but smaller. Acrostichals only bi-serial. Male abdomen more shining. Upper lamellae viewed from behind with the two rounded projections on its middle third very unequal in size—the upper one very large, lower one very small. Female with hind femora and tibiae more slender, the bristles beneath femora smaller, and the ordinary short pubescence above the femora and tibiae less noticeable.

Length 4.25-5.75 mm.

Common at Aviemore (Inverness) at end of May and beginning of June, 1913.

R. subcinerascens, n. sp., ♂ ♀. Differing from *sulcata* and its allies so far as Britain is concerned by the distinctly-bristled tarsi and the darkened cloud about the axillary angle of wing of female. Previously standing in our collections as *cinerascens* Mg. The true *cinerascens*, which has not at present been found in Britain, differs in having the abdomen of the male more shining and the basal joint of the hind tarsi more slender and less bristly, while similar differences are to be found in female hind tarsi.

Length 6-7 mm.

From Hants, Sussex, Kent, Cambs and Suffolk. A very early species occurring from the beginning of April to middle of May.

Subg. ACLONEMPIS Collin.

R. albobirta, n. sp., ♂ ♀. A dark-grey species resembling *eupterota* Lw., but halteres blackish. Very *Empis*-like in general appearance. Acrostichals and dorsocentrals fairly long, bi-serial. Abdomen clothed with pale hairs. Male hypopygium and general structure of legs very much as in *Empis lamellicornis* Beck. Female with the four posterior femora pennate above and beneath, hind tibiae pennate above and about the base beneath. *R. umbripes* Beck. has the penis many more times bent and the female with simple legs and simple brownish wings.

Length about 3 mm.

Widely distributed in England and found in Scotland and Ireland. May and June.

This is probably Frey's *R. eupterota*, but the true *eupterota* Lw. has pale halteres.

Subg. HOLOCLERA Schin.

R. caliginosa, n. sp., ♂ ♀. Resembling *R. nigripennis*, but with palpi yellow. Male hypopygium differing in the upper lamellae showing in profile a distinct projecting tooth at base above. Female with paler prothorax, and hind femora with 3-4 distinct small spines beneath towards tip.

Length 2.5-3 mm.

Glamorgan, Kent, Norfolk, Suffolk; also from Wexford (Ireland). July, August.

R. lamellata, n. sp., ♂ ♀. Resembling *R. nigripennis*, but larger. Male hypopygium with long bristly hairs towards end of side lamellae; upper lamellae long and narrow, constricted about middle and bearing very long bristly hairs. Female with a small bristle beneath hind femora about one-quarter from tip. Differs from *caliginosa* in having black palpi.

Length 3-3.5 mm.

Three males and one female. Two males and one female taken by Col. Yerbury at Porthcawl (Glamorgan). One male by Prof. J. W. Carr at Radcliffe-on-Trent (Nottingham) on August 15th, 1918.

Subg. *AMYDRONEURA* Collin.

R. hirsutipes, sp. n., ♂. Resembling *R. erythrophthalma* Mg. (*serotina* Meij. et Oldenb.), but with front tibiae and tarsi extraordinarily long-haired. The tibiae are long-haired behind, the hairs increasing in length towards tip where they are quite two-thirds as long as tibia. Front tarsi with the first four joints considerably enlarged and densely clothed above with very long pale hairs (as long as those at end of tibia). Middle tibiae and tarsi also long-haired, but not so conspicuously so.

Length 3.5 mm.

New Forest (Hants), captured by Dr. D. Sharp and Mr. C. G. Lamb; Crowborough (Sussex), Mr. F. Jenkinson; King's Lynn (Norfolk), Mr. A. E. Atmore; Nottingham, Prof. J. W. Carr; Forres and Logie (Elgin), Mr. J. J. F. X. King; Tunbridge Wells (Kent), Col. C. G. Nurse. August, September and October.

(To be continued.)

Prionus coriarius L. captured by a small bird.—While sitting in my garden on the evening of August 17th, a slightly damaged living ♂ *Prionus* was dropped at my feet by a small passing bird (sparrow or flycatcher), which alighted and tried to recapture it. The beetle was evidently too strong or too heavy to be carried any great distance, and it had probably been captured near an old oak in the vicinity. It is only the second time the beetle has been noted in this district.—G. C. CHAMPION, Horsell: August 21st, 1926.

Phalonia gilvicomana Z. in Herefordshire.—To the two known British localities for this Phaloniid (North Devon and the Cotswolds, see p. 97 of this magazine) a third can now be added. On July 11th, 1926, I captured a specimen of *gilvicomana*, somewhat worn but easily recognisable, flying after sunset in a clearing on the slope of the Doward overlooking Symond's Yat. The species must have a wide distribution in the west country, and it is truly surprising that no one should have come across it for nearly half a century.—E. G. R. WATERS, 184 Woodstock Road, Oxford: August 13th, 1926.

A Note on *Hylaeus (Prosopis) kriegshaumeri* Först.—With reference to Mr. Morley's note regarding this species, on p. 191 of the August number of this magazine, I should very much doubt if it is extinct, or likely to become extinct, in Britain. I took two specimens in Chippenham Fen in 1912, and I found it quite common in Wicken Fen in June and August, 1913. I have not visited either locality since 1914, but, as it was spread over a wide area, I think it could probably be found somewhere in these fens if looked for during the summer.—C. G. NURSE, Lt.-Colonel, Redcote, Rushall Park, Tunbridge Wells: August 19th, 1926.

Reviews.

'THE NATURAL HISTORY OF THE OXFORD DISTRICT.' CONTRIBUTIONS edited by JAMES J. WALKER, R.N., Hon. M.A., F.L.S.: pp. viii and 336, with map: Oxford University Press, 1926.

This work, edited by one of its principal contributors, deserves more than a passing notice, the portion devoted to Geology, Botany, Ornithology, Entomo-

logy, etc., being of permanent value to naturalists generally, whether resident in Oxford or elsewhere. The Entomology, with which we are here mainly concerned, has been contributed by such well-known workers as the Editor, W. J. Lucas, A. H. Hamm, E. G. R. Waters and J. Collins. Prof. E. B. Poulton also gives an account (pp. 313—318) of the history of the Hope Department of the Oxford University Museum, and a list of the valuable insect-collections stored therein.

The Editor's analysis of the Coleoptera and Macro-Lepidoptera found within a radius of seven miles of the city is of interest to all entomologists, as he himself has done so much to study the local fauna during his long residence of twenty years or more in Oxford. The number of species of beetles now recorded from the district, he gives in tabulatory form (p. 191) as 2,120 out of the 3,570 for the whole of the British Islands, equalling 59.3 per cent. Mr. Waters, too, in a similar way (p. 247), gives totals for the Micro-Lepidoptera, 737 out of 1,325, equalling 55.7 per cent. Preliminary lists of the Coleoptera by the Editor have appeared from time to time, 1906—1920, in the 'Reports of the Ashmolean Natural History Society of Oxfordshire,' the first (1906) including 1,399 species, with additions in each of the five supplements, showing that 721 have been added during the past twenty years, mainly due to the continual activity of Commander Walker and Mr. J. Collins.

'The Botany of the Upper Thames,' by G. Claridge Druce (pp. 72—127) is also a valuable contribution by a master of the subject, and of especial value to all real students of entomology.

The book is presented to the members of the British Association at the Oxford Meeting, 1926, and presumably will be obtainable from booksellers by those who may wish to purchase copies.—G.C.C.

'DESCRIPTIONS OF NEW GENERA AND SPECIES OF LEPIDOPTERA PHALAEINAE OF THE SUBFAMILY NOCTUINAE (NOCTUIDAE) IN THE BRITISH MUSEUM.' By SIR GEORGE HAMPSON, BART.: pp. iv and 641: London, Brit. Museum of Nat. History, issued April 24th, 1926.

This volume contains descriptions of all the new genera (239) and species (776) of the Noctuid subfamily Noctuinae left in MSS. by the author when he retired from the Insect Department of the Museum in 1920. Thirteen volumes and two supplements of the 'Catalogue of the Phalaenae' had so far been published, the last [a Supplement II to the Lithosiadae (Arctiinae) and Phalaenodidae] having been issued in the same year. The MSS., as a whole, formed five volumes of the Noctuinae, and the descriptions have been extracted from it and published in one volume, as there was an obvious risk of the unpublished names, under which the insects have been labelled for the past six years, being used by students of the National Collection. Whether the appalling number of new genera, many of which are monotypic, can be identified without the author's keys (presumably included in the MSS.) is perhaps doubtful. An indication of the habitat of those based on a single known species (a full reference to the description of which is given in every case), *Metaprionota* for example (p. 1), would certainly have been of some assistance to any one attempting to name moths of this group. No structural or other figures are given.

THE ORIGIN AND DISTRIBUTION OF THE COAST COLEOPTERA OF THE BRITISH ISLES.

BY GEO. B. WALSH, B.SC.

I. VALUE OF COAST COLEOPTERA AS CRITERIA OF DISTRIBUTION.

In a discussion as to the origin and methods of distribution of at least a section of the British insect fauna, the littoral and estuarine Coleoptera offer several marked advantages over most other consociates.

(1) No other order, with the exception of the Lepidoptera, has so many students as the Coleoptera, and it is probable that we now have a fairly good knowledge of their distribution in Great Britain at least, although our knowledge of the Irish Coleopterous fauna is still much in need of amplification, as regards both its constitution and its distribution.

(2) Since so many coast beetles are terrestrial in habitat during the adult stage as well as during the larval condition, their connection with their environment during the whole of their life-history is a very close one. Hence their line of migration from the point at which they entered the country to their present localities has been in many cases—though not, as we shall see, in all—restricted to the narrow strip of land bordering the sea. As the character of this land has probably been altered less by civilisation than that of most of the rest of England at any rate, it is probable that we can, from a study of these animals, gain a better idea of some of the means by which an insect can be carried from place to place than it is possible to gain from the distribution of beetles of more general occurrence.

(3) Furthermore, owing to the protection afforded by their resistant chitinous integument and to their hardy nature, so that somewhat prolonged immersion is not likely materially to injure them, there is a greater possible variety of methods of transport than can be used by the more fragile and more strictly aerial Lepidoptera.

(4) Again, beetles feed on a very varied assortment of pabula, which are generally of more wide-spread distribution than the usually strictly localised food-plants of the Lepidoptera; this is particularly the case with insects that feed on shore refuse (especially rotting seaweed) and the Arthropod organisms associated therewith. This eliminates the difficulties that arise from restricted distribution of the food-plants.

(5) Finally, it is probable that many species have several generations in the year, so that there is an increased number of

possibilities of their transference to other localities during the adult stage.

II. GENERAL CHARACTERISTICS OF THE DISTRIBUTION OF THE COAST COLEOPTERA.

The late W. E. Sharp,^{33 34} has discussed at some length the distribution of the British Coleoptera as a whole, and his main general conclusions agree with those reached by workers on the distribution of other groups of the Britannic fauna and flora. He pointed out that our beetles might be grouped in three more or less overlapping provinces, corresponding to their arrival in this country in three migrational streams: (1) from the East (probably of Siberian or, at least, Asiatic origin); (2) from the North (probably from some ancient circumpolar continent); and (3) from the South and South-West (a stream, at least proximately, largely of Lusitanian origin).

A study of the coast Coleoptera confirms these general conclusions based on the study of the British beetle-fauna as a whole; but it seems probable that further interesting conclusions may legitimately be drawn from the distributional data.

A. In the first place, out of the couple of hundred species usually associated with the coast, roughly three-quarters, which are to be assigned to the EASTERN division, are, strictly speaking, not *coast* Coleoptera at all; that is, while littoral in habitat, they are not truly halophile in character. The species fall mainly into Groups II and III of my earlier paper on the Coast Coleoptera³⁸, that is, the geophiles and pontohelicoles. On the Continent these form part also of a typical inland fauna, with no relation whatever to a coast habitat as such. When the invasion of Britain by the 'Siberian' element took place after the Ice Age, the littoral tract was, naturally, colonised first, and, in the case of many so-called coast beetles, this formed the limit of their advance. Some reasons that may be advanced for the stoppage and for the restriction of these species to the coast areas, more especially of South-Eastern England, are as follows:—

1. The cessation of 'pressure from behind' owing to the breakdown of the land connection with the Continent; this would prevent the entrance both of new species and also of further individuals of resident species, and so both interspecific and intraspecific competition would be reduced to such a level that further advance would be stopped. There are several objections to such a theory, however. In particular, the idea of such competition is not universally held by naturalists; e.g. both Kropotkin and

Kellogg have expressed themselves as dubious even of its existence to any marked degree; and a long experience of field natural history has given me very few examples, and those only very localised cases, where insect life has increased to such an extent as in any way to affect the supply of suitable food or the provision of suitable habitat. Again, even admitting the occurrence of such competition, the question may very pertinently be asked as to whether it expresses itself in the form of 'pressure from behind,' as with a human crowd, so that, on the breakdown of a land connection with the Continent, the pressure would automatically cease and further advance be stopped.

2. The limits imposed by climatic conditions, more especially of summer temperatures. This seems a much more feasible explanation, although in very few cases is it possible at present to quote any deciding factor; *e.g.* Harrison¹⁸ has suggested as the limits of distribution of the Kentish Glory Moth (*Dimorpha versicolor* Linn.) the winter isotherm of 5° C. and the summer one of 7° C. It is probable, however, as pointed out in a previous paper,¹⁹ that the relation to climatic conditions is a much more complex one than one of temperature alone, as is shown by the difficulty of naturalising species in what are presumably very suitable localities.

3. The barriers imposed by tracts of unsuitable country, more especially, probably, by the chalk and limestone areas (for psammi-
coles), and by cultivated land.

B. The NORTHERN group of coast Coleoptera is a much smaller one, consisting, at the most, of only three or four species; but it includes at least one species (*Micralymma marimum* Stroem = *brevipenne* Gr.) with a definite dependence on a marine habitat. Fowler¹⁵ says that it is the only species of the genus found in Europe, where it occurs on the northern coasts (Heyden, Reitter and Weise²⁰), while the rest of the genus occurs in Siberia, Greenland and North America. It is probable that *Omalium laeviusculum* Gyll. and *O. riparium* Thoms., both dependent on decaying seaweed, are of northern origin; as is possibly also *Otiorrhynchus ovatus* Linn., which occurs over the whole of Europe, in Western Siberia and the north-eastern part of the United States. The two Brachelytra are definitely littoral, but the weevil, though found chiefly on the coast in Britain, is not truly halophile.

C. A very much larger group of littoral Coleoptera consists of species whose distribution in these islands and on the Continent is markedly SOUTHERN and especially SOUTH-WESTERN. This includes :—

1. All the species quoted by Day,¹¹ Keys²⁴ and Walsh²⁸ as being strongly halophile, with the possible exception of *Trogophloeus halophilus* Kies.; this is quoted by Heyden, Reitter and Weise²⁰ from Europe and the Caucasus, and is not a strictly sub-maritime species, since it has been recorded from several inland localities, e.g. Hopwas Wood, Tamworth, Lincoln, and Suffolk (Fowler¹⁵); this is very possibly, therefore, an insect which is gradually adapting itself to saline conditions, and is now in the transition stage.

2. Probably all feeders on marine rejectamenta and all feeders on organisms connected with such material, including both strictly predaceous species and parasites; e.g. *Nebria complanata* Linn., which occurs in S.W. England, Wales, Ireland, France (on both the Mediterranean and Atlantic coasts), Portugal, Spain, Italy and Algeria; *Aleochara grisea* Kr., which has a littoral distribution from Germany to the Western Mediterranean; and *Myrmecopora urvida* Er., which, in addition to its British distribution, occurs especially in the Mediterranean region—S. France, Italy, Dalmatia, Malta and Tunis.

Many of these species are, of course, of wide distribution on the Continental coasts, so that, in some cases, it is difficult to fix a possible centre of origin; but still, in the main, the distribution fits in well with the general principle of a Southern or South-Western origin, as stated.

3. All the species connected with plants of South-Western origin, e.g. *Polydrosus chrysomela* Ol., which occurs on *Artemisia maritima* in South Britain, Ireland, France and Portugal; *Omo-phlus rufitarsis* Leske (= *armeriae* Curt.) on *Armeria maritima*, which occurs chiefly in Southern Europe.

III. ORIGIN OF THE TRULY LITTORAL COLEOPTERA.

The total for these three groups of Southern insects, together with the small Northern group, whose dependence on a littoral habitat is more or less directly due to the sea, is about sixty or seventy species; and their apparent derivation from a Southern or Northern centre of origin, rather than from an Eastern one, is only what we should expect on evolutionary grounds. We may take it, I think, that the adaptation to a highly saline diet and habitat has been a very gradual one, extending over many generations, and that the length of time which has elapsed since the Glacial Epoch (17,000-20,000 years, according to Dr. White,⁴⁰ and possibly much less, according to Prof. Gilligan) has been

much too short to allow the Eastern insects of inland origin to adapt themselves to such conditions. This implies evolution during a lengthy period along the shores of a more or less permanent coast-line. This in some few cases—the Northern group of halophiles—was doubtless the shore of the great circumpolar continent which probably existed down to at least late Tertiary times; but by far the greater number originated either in the Mediterranean area or on the coast of the Atlantic Ocean approximately in the latitude of Spain and Morocco. Only about eight of the species are mentioned by Wollaston⁴¹ as occurring in the Madeiras and Canaries, so that evolution must have taken place on fairly modern continental shores; and in all probability these few species owe their presence on the islands to some one of the means of distribution discussed later in this paper.

Balfour-Browne,⁶ in a very interesting discussion on aquatic Coleoptera in South-Western Ireland, has suggested that possibly our so-called 'Lusitanian' species really reached us 'from the North and that they reached the Spanish peninsula from the same direction.' 'At the time when the British Islands enjoyed a tropical climate, these "Lusitanians"—if they were then in Spain and Portugal—must have been high up in the mountains,' where the temperature was lower. This state of affairs, however, could not possibly occur with such halophile species as *Aepus* and *Aëpophilus*, and so presumably the whole hypothesis falls to the ground.

The hypothesis as to the origin of our littoral (*sensu stricto*) Coleoptera on some Mediterranean or (approximately) 'Lusitanian' coast in the majority of cases on the one hand, or on some Northern coast in a few cases on the other, is supported by the distribution of halophile members of other divisions of the Arthropoda.

A. Hemiptera. The most definitely halophile Heteropteron is *Aëpophilus bonnairei* Sign. Butler⁹ quotes as its known distribution the coasts of S.W. England, the South and East of Ireland, France and Spain, which, by parallel with other insects, strongly suggests a Southern origin.

The littoral species of *Salda* are of such wide distribution that it is difficult to suggest what is likely to be the country of origin of any particular species: *S. pallipes* Fab., for example (*vide* Butler⁹, p. 299) 'is generally distributed in suitable localities in Europe up to 69° N.; it is found also in Algeria, Turkestan, Persia and Siberia, and extends its area into America, both Nearctic and Neotropical, where it has been taken at a height of 9,500 feet.' Probably, at present, the utmost that we can say here, as with the

other species of *Salda* in question, is that such a distribution is, at any rate, not inconsistent with the theory of an 'Arctic' origin.

B. Collembola. Brown⁵ quotes rather less than a dozen species of Collembola as being littoral, and of these only two are strictly halophile (*Anourida maritima* Laboulb. and *Archisotoma besselsi* Pack.), the others being found inland as well. Of these two, *A. maritima* (fide J. M. Brown, *in litt.*) occurs in Sweden, Denmark, North Germany, Holland, France, Great Britain and Ireland, and the Atlantic coasts of North America; while *A. besselsi* occurs in Great Britain, Norway, Finland, Spitsbergen, Greenland and North America. Both of these distributions are strongly suggestive of a Northern centre of origin.

C. Diptera. Unfortunately, as Mr. Jas. E. Collin says *in litt.*, far too little is known of the distribution of the Diptera to enable us to come to any safe conclusion as to the country of origin of the halophile or littoral Diptera. † Some species certainly have a very wide distribution, for a species of *Limosina* (*L. brachystoma* Stenh.), described from Scandinavian specimens, which also occurs on seaweed in the South of England, has been found on seaweed in the Seychelles Islands.'

D. Terrestrial Isopoda. *Ligia oceanica* Linn. is apparently our only halophile terrestrial Isopod, and even it is not strictly so, for, though Sars says 'that it deserves its specific name, being apparently restricted to those coasts that are open to the oceans,' Dr. Walter E. Collinge informs me that it is recorded in Ireland from the non-maritime county of Armagh, and in England from the banks of the Dee at Chester. Abroad it occurs on the coasts of Norway, Denmark, Belgium, France, Spain, Faroe Islands, Baltic Sea, North Sea and Mediterranean, and Rhode Island, U.S.A. This seems again to fit in with a Northern centre of origin.

E. Pseudoscorpiones. The false-scorpions illustrate in a very interesting way the relations of the two sections of our littoral fauna. *Obisium maritimum* Leach lives 'always below high-water mark, and generally in places subject to rather deep immersion at every tide' (Kew²²); and that author says 'it is likely to have an extended range on the littoral zone of Ireland; Beyond, it is known in the Isle of Man, on the Western and South-Western shores of Britain, in Jersey, and on the Northern and Western shores of France,' which fits in well with a South-Western origin.

Chelifer latreillii Leach, which is always maritime in Britain, occurs on coast sand-hills, at roots of marram-grass, under old wood etc., that is to say, its relation to the sea is much less definite than that of the previous species, and this is, so far as is known

at present, confined to the East and South of England (Kew²³); that is, it presumably belongs to the Eastern element in our fauna.

IV. SURVIVAL IN BRITAIN DURING THE ICE AGE.

The occurrence of these Northern and Lusitanian forms in Britain raises anew the much-discussed question as to the survival of these faunas in Britain during the Ice Age. The older opinion seems to have been that all life was stamped out in Britain, at any rate north of the Thames, during the Glacial Epoch; this view has been vigorously upheld by Clement Reid,³⁰ while others, e.g. Bulman,⁸ Scharff,^{31A} have as strongly advocated the opinion that there was some survival of life, possibly on 'nunataks.' Of late years several Northern naturalists, e.g. Elgee,¹⁴ Harrison,¹⁹ who have studied distribution very carefully in the field, have advanced further reasons for the belief in the survival of at least parts of our fauna and flora during the Glacial Epoch. Whatever, however, may have been the state of affairs of a purely island fauna, it is inconceivable that there was any survival of these Northern and Southern littoral forms over at least a very considerable part of the present coast-line of Britain during the Ice Age. Kendall²¹ states that the whole of the North Sea was filled with ice; that is, not with berg ice, but with glacial ice from Scotland, Scandinavia, etc., that completely expelled the salt water and obliterated the present coast-line as such. According to Reid (l.c.), too, the Southern coasts of Britain and even of Ireland were so much affected by ice that it is difficult to see how any of our coast Coleoptera could possibly have survived.

V. MEANS OF DISPERSAL OF COAST COLEOPTERA.

If this contention be a just one, we have to explain the recolonisation of our coasts from the East and the South after the Ice Age, for, since the whole of the Northern parts of our coasts was ice-covered, there could have been no recolonisation from the North. The species of the littoral Coleoptera which are not halophile (s.l.), either directly, or indirectly by dependence upon some halophile plant, would, as stated before, come from the East, and the halophile species from the South and South-West. The chief, and possibly the only, agents of distribution seem to be four, *vis.* passive carriage in material on the feet of birds; passive carriage by the wind, just as it carries seeds and inorganic matter; passive carriage by the sea, either by tidal currents or by the northward movement of the North Atlantic Drift; and a general active locomotion of the insect, either by ambulation or flight, doubtless more or less assisted by the wind.

(a) BIRDS. There seems little doubt that birds are instrumental to some extent at least in the transfer of seeds from place to place, and probably also in the carriage of certain Mollusca; but there seems far less likelihood that they would be instrumental in causing the spread of coast Coleoptera. Eggs of beetles are not usually so loose as to be readily shaken off by the feet of birds, as they are usually placed in such positions as to be unlikely to be dislodged. The larvae, too, are usually well out of reach—under layers of rock, on clay cliffs under flakes of soil, at roots of plants, etc.; and many of them would not bear the dessication probable during flight; while the adults are often so large as to make carriage most unlikely, or so active or hidden as to render any adherence to the feet of birds most unlikely.

(b) WIND. The idea that wind is partly responsible for the spread of insect life is an old one, and was invoked, for example, by George Lewis²⁸—though apparently without general acceptance of the suggestion—for explaining the oft-noticed occurrence of insects on snowfields and other elevated portions of mountain ranges. Many beetles readily take to flight (*cf.* Champion¹⁰), and undoubtedly in many cases are blown about in enormous numbers—often, of course, to destruction, but sometimes doubtless to new grounds fit for colonisation; *e.g.* on the Durham coast north of Hartlepool the best time for collecting *Hydnobius perrisi* and rare species of *Liodes* (*Anisotoma*) is about the last week-end in October, at times when a land-breeze is blowing, and these beetles fall into the shelter of the lee of the sand-dunes; and several entomologists have noticed the occurrence of swarms of land-beetles among rejectamenta cast up by the waves, *e.g.* W. E. Sharp,³⁵ Scott,³² Tottenham.³⁶ Among the Lepidoptera there is a growing mass of facts showing that dispersal by wind is an important factor in the spread of insects. This frequently occurs in the larval stage, and I put forward the suggestion that the hairy covering of many larvae—notably of Bombyces and particularly in the first instar, when the ratio of the length of the hairs to the weight of the caterpillar is relatively larger than at later stages—is an adaptation to secure this dispersal by wind. Harrison has illustrated this in the case of the Vapourer Moth (*Orgyia antiqua* Linn.), and Minott²⁶ has given a full account of experimental work in connection with the Gipsy Moth (*Porthetria dispar* Linn.), in which he has shown that larvae may be carried under favourable conditions for distances of twenty miles or even more.

In the case of coast Coleoptera, it is probable that dispersal by the wind takes place only in the adult condition, and even here it

is impossible, of course, with most apterous species like *Micralymma*, although it is a possibility with saltatory insects like *Longitarsus*. The fact that flight seems to be most in evidence about the time of the two equinoxes, when the insects are either leaving or seeking their hibernacula, and when the winds are strongest, would facilitate wind-dispersal; and by the fact that numbers of the species would be in flight at the same time and would be carried in the same direction, there would be a greater chance of the settlement of a number of individuals in a new home, and therefore a less risk of the colony dying out through the effects of inbreeding.

The effect of the wind will depend on its strength, its direction, the season at which it blows with reference to insect flight, and its persistence in one direction. The dominant wind for Britain as a whole is undoubtedly the South-West, which blows for approximately three days out of every five, and its effect, owing to its seasonal effect and persistence, would be expected to be most marked in the autumn, and to operate most decisively in the case of insects which entered this country from the South-West; these should apparently have a more northerly extension on our West coast than on our East, but a careful examination of the recorded localities of this element shows that the northward ranges on both sides of our islands are so nearly equal as to render the idea untenable. Furthermore, although many of these insects will be blown inland, nevertheless, owing to their definite dependence on the coast for food, they rarely, if ever, make permanent settlements away from the sea. It would be interesting in this connection to know if some of the older inland records of coast insects, e.g. Blatch's⁴ record of *Micralymma* three or four miles up the Mawddach, are still true. The effect of wind dispersal is probably more clearly shown in the case of the Eastern element of our fauna. During the spring and early summer, the commonest wind on the eastern coast of Britain is more or less from the East. This blows at a time when many beetles, with the demands for provision for the next generation rising strong within them, are in flight after hibernation; and it seems probable that the coincidence of these three events does actually explain (1) the occurrence in Britain of many Continental insects; some of these have doubtless settled down as permanent elements of our fauna, e.g. *Plusia moneta* Fabr. in the Lepidoptera, while others, e.g. *Agelastica alni* Linn., either never breed at all or else, after a more or less extended survival, depending upon a variety of causes, mainly directly or indirectly climatic, die out altogether, to be replaced,

sooner or later, by other immigrants, e.g. *Pygaera anachoreta* Hübn. (Lep.²); (2) the occurrence inland of isolated colonies of insects usually connected with the coast (v. Walsh.³⁸).

(c) OCEAN CURRENTS. The movements of water round the British Isles are partly meteorological in origin, forming part of the great North Atlantic Drift, but to a much larger extent tidal, this movement being, to a greater or less extent, more local than the former.

(i) *North Sea*. The currents of the North Sea may, except for those in the immediate neighbourhood of Dover, be regarded as closed in on the South. The tidal current generally runs more strongly to the South than in the opposite direction, but there is also a permanent current, due to meteorological causes, running south along the East coast as far as Norfolk and then sweeping round to the East and passing in a north-easterly direction to the coast of Norway; this current has a speed of from two to seven miles per day.

(ii) *The Channel*. The Channel currents also are unaffected by the Straits of Dover. There is a line of tidal separation across the Straits dividing the North Sea tides from the Channel tides. This line is not quite fixed, but oscillates from Beachy Head to the North Foreland; at the same time it as emphatically divides the two sets of tides as if there were a barrier across.

The tides of the Channel are wholly oscillatory, but continued westerly or south-westerly gales cause the current to run longer up the Channel than in the reverse direction. This has the effect of producing a general progression towards Dover (v. Avebury,¹ p. 140).

(iii) *Irish Sea*. The tidal currents on the west coast of England are in two sets. The point of division is Morecambe Bay. The northern set oscillates across the north of the Isle of Man and out into the Atlantic through the North Channel; the southern set follows the coast-line south through the St. George's Channel. Prolonged southerly gales cause the tides to run in the northerly direction for a longer period than in the reverse, while winds from the other three quarters have little effect.

If the North Channel were blocked, the only difference produced in the currents of the Irish Sea would be that there be no separation into two sets, but the currents would oscillate wholly longitudinally as before.

Taking into account the prevailing winds of the British Isles, we may say that the resultant current in the Channel is towards Dover; in the Irish Sea it is in two independent parts: from the

South to the Isle of Man (approximately) and from the North Channel to the Isle of Man; while in the North Sea it is southerly along the east coast of Scotland and England. Outside these restricted areas the Gulf Stream has full sway.

Now, apart from field observations such as the interesting note by Edwards,¹³ it would seem highly probable from *à priori* considerations that many halophile insects are distributed, in part at least, by water agency. We may note, for example:—

1. The sluggish nature of so many halophile species, which frequently 'sham dead,' and are very often markedly disinclined for flight, as are so many of the Diptera associated with decaying seaweed.

2. During movements of dead weed, etc., owing to spring tides and high winds, the weed with its inhabitants is often shifted as a whole.

3. The power of bearing prolonged immersion possessed by many halophile species (*cf.* Barthe.²).

4. The apterous character of, in particular, so many of the most decidedly subarctic species, e.g. *Aëpus marinus* Ström., *A. robinii* Lab., *Micralymma marinum* Stroem (= *brevipenne* Grav.), *Aëpophilus bonnairei* Sign., the female of the midge *Clunio marinus* Hal. This renders distribution by wind agency an impossibility.

(To be concluded.)

NOTES ON THE EMPIDIDAE (DIPTERA), WITH ADDITIONS AND CORRECTIONS TO THE BRITISH LIST.

BY J. E. COLLIN, F.E.S.

(Continued from p. 219.)

Other alterations and additions to the 'List' in the genus *Rhamphomyia* are as follows:—

R. spissirostris Flin. must be struck out. The name was added by Verrall upon specimens of the next species. The true *spissirostris* has not so far been captured in this country.

R. dissimilis Zett. Zetterstedt first described this species from the female only as *maculipennis*, and six years later, having received both sexes from Staeger, redescribed the species as *dissimilis*. There is no doubt but that the species must in future be known as *maculipennis* Zett.

R. pennata Macq. Described in 1827 for a species of which Macquart himself, four years previously, had described the male as *bicolor* and the female as *barbata*. Neither in 1827 nor at any subsequent date did Macquart refer to these two names, but com-

pletely ignored their existence; indeed in 1827 he deliberately described as a new species a completely different *Rhamphomyia* under the name *bicolor*. There can be no question that one of Macquart's earlier names must be used for the species we have long known as *pennata*, and I prefer to adopt *barbata*, to avoid any further confusion over the name *bicolor*. *R. pennata* should be known therefore in future as ***Rhamphomyia barbata* Macq.**

R. plumipes Meig. and *R. geniculata* Meig. An error in the identification of Meigen's *plumipes*, started by Fallen in 1816, has been unfortunately accepted by most subsequent writers and the name consequently misapplied ever since. Meigen described *plumipes* in 1804 as a species the size of *sulcata* (length 3 lin.), and when elaborating this description in 1822 added that the *front* femora of the female were feathered beneath. The type specimen still existing in the Paris Museum answers to this description, and is a female of the species we have known as *vespertilio* Zett. The species described by (amongst others) Fallen, Zetterstedt, Lundbeck and Frey as *plumipes* must in future be known as ***geniculata* Meig.**

R. costata Zett., described from the female only, is the same species as *tibiella* Zett., described from both sexes. The name *costata* will disappear from the 'List' and *tibiella* take its place.

R. aethiops Zett. Frey sinks this species as a synonym of *caudata* Zett., but I cannot agree with this synonymy. Both species were originally described in the 'Insecta Lapponica,' and if Zetterstedt had given no other descriptions of the two species there might be some doubt as to whether his *caudata* was not really the male of his *aethiops*, but in his 'Dipt. Scand.' he so clearly differentiated the more shining *caudata* with more pilose male legs and the female legs not feathered, from the duller *aethiops* with less pilose male legs and female legs feathered, that one is bound to accept the two species as distinct. I consider that Frey has redescribed *caudata* Zett. under the name *longestylata*.

The late Mr. Verrall caught two males and a female of *aethiops* at Rannoch, in Scotland, on June 20th, 1870, and I caught several near Aviemore (Inverness) from May 25th to June 8th, 1913.

R. albipennis Fall. was fairly common in the Aviemore district of Inverness-shire at the end of May, 1913, but it appears to occur also in the South, for Col. J. W. Yerbury caught a male at Ringwood (Hants) on May 21st, 1908, and Col. C. G. Nurse finds it at Tunbridge Wells in May on the flowers of the Wood Anemone.

R. curvula Frey. Apparently not uncommon in Scotland (Dum-

barton, Stirling, Inverness, Nairn) and recently found by Mr. H. Britten in Cheshire.

R. obscura Zett. is known to me as British from only a pair of specimens taken by Mr. J. J. F. X. King at Kilmun (Argyllshire) on June 16th, 1906 (v. Ent. Mo. Mag. 1913, p. 105).

R. hirtula Zett. A pair of this rare species, previously recorded from Greenland only, were taken on flowers at Clova (Forfarshire) by Mr. J. H. Burkill in 1895 or 1896, when studying the insect visitors to flowers in that locality (v. Ent. Mo. Mag. 1913, p. 105).

R. plumipes Meig. The true *plumipes* Mg. (v. note above) is known to me as British from a single female only obtained by Mr. Claude Morley by sweeping at Foxhall, near Ipswich (Suffolk), on May 30th, 1896. The male is remarkably like that of the next species (*vesiculosa* Fln.); the wings, however, are not clouded about the axillary angle and lower margin, the thoracic pubescence is rather shorter and the dorsal projection of hypopygium is rather longer and not so broadly dilated spoon-like towards the tip.

R. vesiculosa Fln. I caught a pair of this remarkable species at Aviemore (Inverness) in 1913, the male on May 25th, the female on May 29th.

R. stigmosa Macq. *R. albosegmentata* Zett. was added to the 'List' on the strength of specimens of *stigmosa*, but the name *albosegmentata* may remain in the List, for I have seen a female specimen which I feel sure is the true *albosegmentata* taken by Capt. the Rev. J. Waterston at the head of Loch Etive (Argyllshire) in August, 1919, and now in the British Museum Collection.

R. conformis Kow. must in future be known as *R. laevipes* Fln.; Zetterstedt in 1842 definitely limited the type of Fallen's species to a specimen referred to by Fallen as taken by Zetterstedt at Larketorp in Ostrogothia. This specimen exists in Zetterstedt's Collection, answers to Fallen's description and is a male of the species hitherto known to us as *conformis* Kow.

R. tibialis Zett. Added to the List by myself in 1913 (Ent. Mo. Mag. xlix, p. 105).

R. nitidula Zett. This is a shining black species with the first joint of male hind tarsi thickened and somewhat bristly, allied to *tibialis* and the *sulcata*-group. It was not uncommon in the neighbourhood of Aviemore (Inverness) at the end of May and beginning of June, 1913. It occurs further South, however, for Mr. C. A. Cheetham has taken it at Gormire (Yorks) and I caught a pair at Ivybridge (Devon) in May, 1914.

R. ignobilis Zett. structurally much resembles *nitidula*, but is a much duller, greyer insect. It has been redescribed by Frey as *attenuata* n. sp. I have compared Zetterstedt type with British specimens and have no doubt they represent the same species. This is another of the species taken by me in the Aviemore district (Inverness) late in May, 1913.

R. morio Zett. This is the *R. fumipennis* Zett. of the 'List.' I have examined the types of Zetterstedt's three species, *morio*, *villosa* and *fumipennis*, and consider that they represent only one species, which is easily recognised so far as British species are concerned by the strongly bristled palpi and basal antennal joints and the presence of a few bristles on the face. I follow Frey in using the name *morio* for this species.

R. erythrophthalma Meig. This is the species which Oldenberg, in 1915 (Arch. für Nat. liii, p. 71), and de Meijere, in 1918 (Tijd. v. Ent. lxi, p. 137), described as *serotina* n. sp. It is a species of the subgenus *Amydroneura*, with bristles on thorax and scutellum yellowish, abdominal pubescence pale and legs simple and comparatively short-haired in both sexes. It is one of the few species of *Rhamphomyia* occurring in the autumn (September and October) and is widely distributed throughout England and Scotland. I have seen the original type of this species in Meigen's Collection at Paris.

R. nigripennis F. was added to the List in 1913 (Ent. Mo. Mag., p. 105), and *R. culicina* Fall. in 1911 (Ann. Scot. Nat. Hist., p. 83). The *R. hybrida* added in 1913 (Ent. Mo. Mag., p. 105) proves upon examination of the types to be, as suspected at the time, the same as *sciarina* Fall., a name which was already in the 'List.'

Finally the name of an unrecognised species (*R. caesia* Meig.) will be found in the 'List.' It is a name which will almost certainly be some day revived for one of our well-known species. The type specimen is in the Vienna Museum, and Oldenberg, who has recently examined it, came to the conclusion that it was a female of either *geniculata* Mg. (*plumipes* Flin. nec Meig.) or of *filata* Zett.; in either case the name *caesia* would have priority. For the present this name might well be omitted from the 'List.'

EMPIS L.

In 1909 Bezzi started to subdivide this very large genus into subgenera, but apparently never completed the task. Most of his suggested subgenera are certainly natural groups of considerable

use in dealing with a genus of such unwieldy proportions as *Empis* sens. lat. As such I include *Lissempis* with type *nigritarsis* Meig. ; *Xanthempis* with type *stercorea* L. ; *Anacrostichus* with type *nitida* Meig. ; *Polyblepharis* with type *albicans* Meig. *Argyrandus* with type *dispar* Scholtz is possibly not sufficiently distinct from *Xanthempis*. It is very doubtful if *Coptophlebia* with type *hyalipennis* Fall. is a natural group, but the abbreviated upper vein from discal cell is a convenient character by which to separate off a number of species, even if it may ultimately prove to be not wholly reliable as a group character.

It is generally acknowledged that the type of the genus *Empis* was fixed by Latreille in 1810 as *E. pennipes*, in which case Bezzi's *Pterempis* becomes a synonym of *Empis* sens. strict.

Pachymeria Steph. with type *femorata* F. should, I think, be enlarged to include those species like *tessellata*, *morio*, *nepticula*, *kertesszi*, *ciliata*, *spiralis*, *picipes* Meig. (*brevicornis* Lw.), etc., which have the prothoracic sternum hairy all over, even between the front coxae, and the discal cell not truncate at end.

It is possible that *borealis*, which in some respects resembles an *Anacrostichus*, but has a hairy face and the ventral lamella of male hypopygium, with two long internal processes, should form the type of a subgenus *Platyptera* Meig.

There is a group of which *rustica* Fall. may be taken as the type which are large or rather large, narrow bodied, long-legged species, with ample, never blackish, sometimes maculated wings ; anal vein distinct to wing margin ; male hypopygium very distinctive, side lamellae long and narrow, upper lamellae rather prominent and bilobed, penis long and usually very undulated. Female legs always extensively yellow. This group, of which *grisea* Fln. is the only British representative, may be known as *Leptempis* n. subg.

Another natural group of species is composed of *livida* L., *sibillina* Bezzi, *macropalpa* Egg., *macquarti* Beck. (= *geniculata* Mcq. nec Zett), *nigrimana* Beck. and *algira* Macq., etc. It is distinguished by the faint anal vein which does not reach wing-margin, the second or first and second veins from discal cell often not reaching margin, the cubital fork rather acute, a small bristle in comb at tip of hind tibiae behind. The males have the upper eye-facets scarcely dilated, no rows of long bristles beneath middle femora, and the upper lamellae of hypopygium, often very large, always much larger than side lamellae, occasionally (*livida*) composing almost the whole of hypopygium. The species are never

very small and the discal cell is not truncate at end. *E. algira* Macq. may be taken as the typical species and the subgenus known as **Kritempis** n. subg.

A remarkable new species, taken by Mon. Hervé Bazin at St. Pierre le Chartreuse (French Alps) in July, 1913, must form the type of an additional subgenus, to which it is proposed to give the name of **Rhadinempis**. It has the axillary excision in wings obtuse (greater than a right-angle), as in *Lissemphis* and *Xanthempis*; the acrostichal bristles are absent and the dorsocentrals only uniserial; the antennae very short, the third joint short and pointed, only about as long as first two together and half as long as the microscopically pubescent arista. The insect generally reminds one of a species of *Holoclera*, but has of course the Empid fork to the cubital vein.

Empis (Rhadinempis) bazini. n. sp., ♂ ♀. Eyes touching on frons with upper facets distinctly enlarged; face short and narrow; ocellar triangle prominent with a pair of bristles and other shorter hairs. Proboscis longer than head is deep. Palpi very slender, dark brown. Occiput, thorax and abdomen dull dark brownish-black in most lights but from some points of view of a distinct greyish tint; pleurae always greyer and belly greyish, often translucently reddish-yellow about base. About two rows of bristly hairs on occiput; thoracic bristles distinct, about 8-10 pairs of dorsocentrals, a long humeral and post-humeral, about three notopleural, 1-2 small supra-alar just behind suture, a long post-alar and four scutellar bristles. A few short bristly hairs on collar, sides of prothoracic sternum with only 1-2 small bristly hairs and episterna bare; metapleural fan composed of a few dark bristly hairs. Abdomen long and narrow, the dark pubescence longest about sides of base, very little longer or more bristly on hind-margins of segments, much shorter on last 2-3 segments. Hypopygium with the side lamellae slender towards tip and with a small inwardly and upwardly bent tooth at tip, ventral lamella with a pair of bristles and a few short hairs; penis slender. Legs slender, somewhat tawny-greyish about base, darker (more tawny-brown) on tibiae and tarsi; in structure and chaetotaxy remarkably like those of *Holoclera nigripennis*, including the row of tiny black points in front of front femora; the basal joint of front tarsi has 1-2 small bristles in front on basal half, and the slender basal joint of hind tarsi a few small spines beneath and at least one above at about middle. Wings distinctly brownish, cubital vein ending in wing-tip, anal vein faint towards tip but distinct again at wing-margin, discal cell small but not very truncate at tip. Halteres brownish.

♀. A rather greyer insect than the male, with abdomen distinctly tawny-brown. Eyes separated on frons by about one and a half the width of front ocellus, frons dusted greyish with about four hairs on each side. Abdomen pointed, ending in a pair of long, slender, dark brown, slightly pubescent, terminal papillae. Abdominal hairs shorter than in male. Hind tibiae with the small bristles a little more conspicuous than in the male and hind femora with a small anteroventral bristle a little before the tip; ungues and pulvilli quite as large as in male. Wings not so distinctly brownish and halteres decidedly more yellowish.

.Length about 3.5 mm.

I place more faith in the structure of the male genitalia as a group character than in the separation of the eyes on the frons or the structure of the hind legs in the male, and consequently place in *Anacrostichus* such species as *lucida* Zett., *verralli* n. sp. and probably *longipennis* Lw.; in *Polyblepharis* all the species resembling *opaca* such as *fallax* Lw., *unicolor* Brullé, *cothurnata* Brullé, and probably *depilis* Lw., *subciliata* Lw., *nigerrima* Lw., *lugubris* Lw., *haemorrhoeica* Lw., *dasynota* Lw., *concosa* Lw., *dedecor* Lw., *damascena* Bezzi, *prepudiata* Lw., *curta* Lw., *pulchripes* Lw., *gravipes* Lw., *longimana* Lw., *connexa* Beck., *crassa* Now. and *haemi* Lw. A peculiarity in the male genitalia of this group lies in the penis, towards its tip, being bent back upon itself.

E. (Xanthempis) bilineata Lw. must in future be known as *digramma* Meig.

E. (Xanthempis) laetabilis, n. sp. Thorax entirely yellowish as in *lutea* and *concolor*, no posthumeral or supra-alar bristle, scutellum with only two bristles, two equally strong notopleural bristles; remarkable for the extremely simple male hypopygium, the upper lamellae are not bi-lobed, the side lamellae have no projection as in *lutea* nor are they pointed as in *concolor*, but in profile are shorter and more rounded, the penis is short and more or less hidden. Frons and vertex not so shining as in *lutea*. Thorax not so shining as in *concolor* and occiput not so extensively darkened, having only a very narrow greyish strip.

Length 5-6 mm.

This species was first known to me from an old female specimen in the Verrall Collection, without locality, but labelled as 'bought of Saunders 12/79'; then I saw another female taken by Mr. J. J. F. X. King at Aviemore (Inverness) on June 26th, 1903. When Col. Yerbury and I visited this locality in the spring of 1913 we captured four males and a female near Loch Alvie by diligent sweeping, on May 27th, 28th and 30th.

(To be continued.)

NOTES ON BRED *ICHNEUMONOIDEA* INCLUDING A NEW SPECIES OF *PRAON*.

BY JAMES WATERSTON.

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Praon lepellei, sp. n.

Belongs to the section of the genus with short antennae and a smaller number of funicular joints. Runs down to *P. abjectum* Hal. from which it differs in its slightly larger size, in the coloration of the antennae and legs, and in the propodeal sculpture. In the recently-described *P. lemantinum* Gaut. the antennae are 16-jointed; the third being nearly twice as long as the fourth.

♀. Colour: black or blackish brown, the trophi, extreme clypeal edge, petiole and succeeding tergite basally but very indefinitely and slightly paler.

Legs clear yellow (hardly ferruginous) with coxae a little darker postero-dorsally; third and fourth antennal joints, like legs, scape and pedicel brownish, but more or less infuscated. The pedicel paler distally.

Wings: stigma pale.

Structure: antennae with 14 joints; the third joint barely one-third longer than the fourth. Propodeon for the most part dull, rugose punctate, especially posteriorly.

Host: The Woolly Aphis (*Eriosoma lanigerum* Hausm.).

Reared by Mr. C. H. Le-Pelley, at East Malling Research Station, Kent, England, 1926.

Besides this parasite of an important pest, the following rearings and captures of parasites seem worth placing on record:—

Glyptomorpha variegata Boh.

♀. Wales, Pembrokeshire, Tenby, vi-vii, 1923 (K. G. Blair).

An interesting capture, as both genus and species appear to be unrecorded for Britain. *G. variegata* has hitherto been unrepresented in the British Museum collection, and the determination is due to Dr. A. Roman, of Stockholm, who makes the following comments:—

‘Your *Glyptomorpha* is well known from the sands of the Baltic coasts, though I did not recognise it at once owing to the uncommonly dark ground-colour of the abdomen. I have only taken it once myself, on the island of Oesel, now belonging to Esthonia, but have seen it from S.E. Finland and from the Swedish islands of Oeland and Gotland and the province of Scania. Besides these, I have a ♂ from the environs of Nuremberg, in Bavaria, so the species seems pretty widely dispersed, though mainly Northern.

‘I think the Finland specimens were reared from a weevil in *Elymus arenarius*. *Vipio guttiventris* Thn. is a synonym.’

Bracon erythrostictus Marsh.

A single ♂ reared by Mr. Blair from galls of *Harmolita hyalipennis* Wlk. on *Ammophila arenaria* Linn., England, Suffolk, Kessingland. Galls collected ix, 25; *Bracon* emerged July, 1926.

Mr. G. T. Lyle tells me he has reared this species from the same gall and grass, and Marshall records it from a similar gall on *Triticum repens*.

Bracon roberti Wesm.

♂ ♀: From *Aegeria* (*Syanthodon*) *andreniformis* Lasp., England, Bucks, Wendover; larvae collected in April; parasites emerged 24th May (K. G. Blair).

This appears to be the first record of a host for *B. roberti*. Some of its near allies also parasitise *Aegeria* spp.

Meteorus fragilis Wesm.

♂. From larvae of *Nola cucullatella*, Epping; emerged 5, vi, 1926 (D. E. Kimmins).

This is a well known host attachment already noticed by Lyle and others. Its interest lies in the fact that from a second cocoon of the *Meteorus* there emerged

Mesochorus facialis Bridgm.

♂. A species of some rarity, or, at least, one whose distribution and host attachment are very imperfectly known.

British Museum (Nat. Hist.).

August 1926.

Notice of request to admit Hübner's (1806) 'Tentamen' to nomenclatorial status under suspension of International Rules.—The Secretary of the International Commission on Zoological Nomenclature has the honor to invite attention of the zoological profession to the fact that application has been made for the suspension of the International Rules in the case of Hübner's (1806) 'Tentamen' in order to establish its nomenclatorial availability.

Briefly summarized: The formal nomenclatorial status of this document, involving about 100 names admitted by some authors as of generic rank, has been under controversy for many years, and opinion of specialists in *Lepidoptera* is still divided.

The arguments, as submitted, in favor of suspension of Rules, maintain that: (1) there are sound reasons both for admitting and for denying recognition of the 'Tentamen,' from the standpoint of interpreting the Rules; (2) the evidence *pro* and *con* is not sufficiently conclusive to remove the question from debate; (3) the rejection of the 'Tentamen' will produce greater confusion than uniformity, will necessitate a vast amount of undesirable labor and economic loss of time and work; (4) if, on the ground of expediency, the Rules can be suspended in this case, the nomenclature of the *Lepidoptera*, as used for the past thirty years, can be largely maintained.

The 'Tentamen' is one of the most important and most controversial cases ever submitted to the Commission. A discussion, with essential bibliographic references, will be found in 'Smithsonian Misc. Coll. v. 73 (4)' (now in press).

The Commission will delay announcement of vote, on the requested suspension, at least until Sept. 1, 1927, in order to give interested authors, and especially entomological societies, opportunity to study the premises and to present to the Commission their views and arguments, *pro* and *con*, regarding the action requested.

In order to protect groups other than *Lepidoptera*, a prerequisite to Suspension of Rules would be that representative specialists in *Lepidoptera* agree upon and furnish to the Commission definite bibliographic references to the 107 names which they view as genotypes.—C. W. STILES, Secretary to Commission, U.S. Hygienic Laboratory, Washington, D.C.: August 21st, 1926.

The Coleoptera of Corsica, by J. Ste. Claire Deville.—In a separately-printed brochure of 31 pages, under the heading 'Le Peuplement de la Corse, Les Coléoptères,' published at Bastia [1926], the author gives a very interesting account of the beetles of the island, and of their ecology and distribution. He groups the natural associations of species under the following headings: Plages maritimes, marais salants, terrain secs et découverts, marécages et

lagunes d'eau douce, eaux courantes, maquis (*Erica*, *Arbutus*, *Pistacia*, *Phillyrea*, *Calycotome*, *Genista*, etc.), forêts d'essences feuillues (hêtre, etc.), forêts de résineux, *Alnus suaveolens*, pâturages alpins et des neiges tardives, fauna hypogée. Rather more than 2,700 species are stated to occur in the island, as against a possible 4,000-4,500 for a similar continental area in the same latitude. A Third Supplement to his 'Catalogue Critique des Coléoptères de la Corse' appeared in Ann. Soc. Ent. Fr., XCV, June 1926. The actual number of species is here given as 2,748, after allowing for certain eliminations. In my own personal experience of Corsica and Sardinia, I was much struck with the abundance and variety of beetle-life at Vizzavona, in the mountains of Corsica, where a fine forest of pine and beech is to be found, as compared with Sardinia, with its scattered oaks and absence of pines, at least in the central regions visited by me.—G. C. CHAMPION, Horsell: August 1926.

A note on the Coleopterous-genus Hydrophytophagus Shuckard.—W. E. Shuckard, in his 'Elements of Entomology,' Part I, p. 173 (1839), placed fourteen species under *Cryptophagus* Herbst, and writes as follows:—'The last two species [*caricis* Oliv. and *typhae* Gyll.] differ from their congeners in many particulars and should constitute a distinct genus which I have not leisure to characterise here, but may be called HYDROPHYTOPHAGUS [a water plant devourer] in allusion to their habits. I hope this sesquipedal name will be pardoned for the sake of its being characteristic.' This new generic name, incorrectly given as *Hydrophytophilus* in Scudder's 'Nomenclator' (following Agassiz), antedates *Telmatophilus* Heer (1841) by two years, but it can only be regarded as a 'nomen nudum' by Coleopterists.—G. C. CHAMPION.

Lymexylon navale L. at Windsor.—In July 1925 I spent a couple of days in search of Coleoptera in this once much-worked locality. Towards the end of the first day I had very little to show for a lot of hard work, but observing an old oak off which a large slab of bark had been stripped, and when about thirty yards distant, I saw three specimens of what I took to be a large Ichneumon repeatedly springing from the bare trunk into the air, and circling about, returning to the tree. On getting closer, I recognised that what I had mistaken for an Ichneumon was *Lymexylon navale* L. The next day the species was to be seen flying round the top of the tree in large numbers like a swarm of gnats; occasionally one alighted on the trunk within reach, when it was quickly captured. The tree contained very few borings, but the trunk was much cracked longitudinally, and it was astonishing to note how easily and suddenly a beetle would emerge through a crack which looked far too small for it to pass through. I did not observe a single male on the wing, but on a dead oak, a few feet away, I found seven very small males: these did not fly or move, but were frequently visited by females: copulation, however, did not take place.

Fowler records the species from Windsor Forest (Stephens and Bowering) among other places, but the only captures I know of in recent years were made in the New Forest where it was first taken by a lepidopterist, Mr. G. R. Baldock, in 1905, and subsequently by various well-known coleopterists.*—E. C. BEDWELL, 54 Brighton Road, Coulsdon: September 13th, 1926.

Teredus cylindricus Ol. and *Cryptocephalus querceti* Suffr. at Windsor in July 1925.—So far as I know, these two species have not been recorded from anywhere south of Sherwood Forest, and I was therefore pleased to find a couple

* *L. navale* was captured in numbers, ♂ ♀, in the New Forest by myself and others in July, 1905, under very similar circumstances to those described by Mr. Bedwell (*cf.* E.M.M., xli, pp. 179, 180, August, 1905).—G.C.C.

of the former amongst oak bark which I had chipped off various trees. The *Cryptocephalus* I tapped from an oak bough on which I saw it settle.—E. C. BEDWELL : September 1926.

Batrisodes adnexus Hampe at Windsor.—A specimen of this rarity occurred to me with *Euryusa optabilis* Heer and *E. sinuata* Er. whilst working a nest of *Acanthomyops brunneus* Latr. at Windsor. Mr. Donisthorpe tells me that this is the second known British example.—E. C. BEDWELL : September 1926.

A note on *Ptinus sexpunctatus* Panz.—I have just bred a specimen of this beetle under rather curious circumstances. In June of last year a pupa of one of the larger *Carabi*, perhaps *C. nemoralis* Müll., was brought to me. It seemed to be alive and was left in the box. When I next examined it, some months later, there was also present something that looked very like a beetle larva, while the pupa was much eaten, with apparently a round hole of emergence behind its elytra. The larva eventually formed a silken cocoon, and in August of this year there emerged a specimen of *Ptinus sexpunctatus* Panz. This was so unexpected, that I think I must have been mistaken in supposing that the larva was an internal parasite; more probably the larva or egg was introduced into the box after the death of the Carabid pupa, though it was a close-fitting tobacco tin.—G. H. ASHE, Hartlebury, Kidderminster : September 2nd, 1926.

Ants collecting seeds of Chelidonium majus L.—The workers of a colony of typical *Acanthomyops* (*Donisthorpea*), *niger* L. [*Lasius niger*] have for some weeks past been busily collecting the seeds of the Common or Greater Celandine in my garden at Cambridge. The opening of the ants' nest is in a gravel path, and a clump composed of several plants of this Papaveraceous weed stands about two feet away. The plants are shedding their seeds freely on the gravel, and numbers of the seeds have been collected into a dense black patch about four inches square round the entrance to the nest. The seeds in this patch lie several deep, and they are also scattered in diminishing numbers round about the patch. The individual seeds are shining black, sub-ovate, covered with a meshwork of raised ridges, and about one to two millimetres long. Although the patch of collected seeds has been in evidence for several weeks, yet I have never succeeded in seeing an ant in the act of carrying a seed; but my opportunities of watching the insects have of late been extremely limited. It cannot be claimed that this observation possesses any great degree of novelty, for Mr. Donisthorpe tells me that there exist published records (by several writers) of the amassment of the seeds of this plant by at least five species of ants, including *A. (D.) niger*. My notes may, however, tend to confirm previous observations, and at least they will have a local interest in connexion with the entomology of the Cambridge district.—HUGH SCOTT : August 4th, 1926.

Reviews.

'DIE OEKOLOGIE DER BLATTMINIERENDEN INSEKTENLARVEN,' von Dr. MARTIN HERING; pp. 253, with one coloured and one photographic plate and 67 text-figures. Verlag von Gebrüder Borntraeger, Berlin, 1926. Price 18 marks.

In this work the different types of mine formed by leaf-mining insect larvae are passed in review and roughly classified according to the form of the gallery and its position in the blade of the leaf. While certain features, if present, indicate a lepidopterous origin for an unknown mine, others a dipterous origin, there are no general features distinctive of the different orders, Lepidoptera,

Diptera, Coleoptera, and Hymenoptera, in which leaf-mining larvae are found. The methods of oviposition, special adaptations of larval structure and pupal habits are all considered, as also are the precise nature of the injury to the tissues, the colour changes resulting therefrom, and the efforts of the plant to make good the injury.

The treatment throughout is general rather than comprehensive, with perhaps undue prominence given to the Lepidoptera. There is no classified list of miners, either systematic or arranged according to the plants affected, and many well-known miners, such as the Coleopterous-genus *Orchestes* [*Rhynchaenus*] and the family Hispididae, are omitted altogether. A bibliography of the more important literature occupies 19 pages.

The indexing leaves much to be desired, a common index serving for a subject index and for the names of the miners mentioned; plant-names are not indexed.—K.G.B.

Obituary.

* *Major John Coney Moulton, O.B.E., M.A., D.Sc.*, died on June 6th last in a nursing home in London as the result of a serious operation, only a few days after his arrival in England on leave from his post in Sarawak.

The son of Mr. John Moulton, of The Hall, Bradford-on-Avon, Wilts., he was born on December 11th, 1886, and educated, first at Eton, and afterwards at Magdalen College, Oxford. There he did much good work, chiefly with the Lepidoptera of that productive district, and he was early recognised as an energetic and competent Entomologist. In 1909 he was appointed Curator of the Sarawak Museum in succession to the late Robert Shelford, and this post he filled with distinction until the outbreak of the Great War called him to military service, at first as temporary Captain, 4th Wiltshire Regiment, and on his transfer to Singapore, as General Staff Officer to the Straits Settlements Command. He received the appointment of Director of the Raffles Museum and Library at Singapore in 1919, and four years later he vacated this post for the highly interesting and responsible office of Chief Secretary to the Rajah of Sarawak.

During his residence in the Far East, Major Moulton contributed a large number of valuable Entomological memoirs, including monographs of the Malayan Cicadidae and the Butterflies of Borneo, to the Journals of the Sarawak Museum and the Straits Branch of the Royal Asiatic Society. His work on the Birds of Borneo (Sarawak Museum Guide, 1914) also merits special mention, as well as the charming narratives of the collecting expeditions made by him from Sarawak and elsewhere, which have appeared in the pages of our contemporary, the 'Entomologist.'

He became a Fellow of the Entomological Society of London in 1907, and his first important paper, on Mimicry in Bornean Butterflies, appeared in the 'Transactions' for the following year. A man of great personal charm, an excellent organiser and administrator, and most popular both with Europeans and natives, his decease at the early age of forty years is deeply regretted by a wide circle of friends at home and abroad. We are indebted to Dr. R. Hanitsch, his predecessor at the Raffles Museum at Singapore, for much kind assistance and information in the preparation of this Memoir.

George Lewis, F.L.S.: *Rev. Francis David Morice, M.A., F.Z.S.*—We deeply regret to announce the decease of these veteran entomologists: the first-named at Folkestone, on September 5th, aged 87; the latter at Woking, on September 21st, aged 77. Fuller notices will be given in our next number.

SOME INDIAN COLEOPTERA (21).*

BY G. C. CHAMPION, F.Z.S.

The twenty-first contribution to this series includes the rest of the Telephorids under investigation. *Lycocerus* is still a mixture, as left by me, owing to the absence of authentically-named examples for study. *Tylocerus*, a genus represented by closely allied Antillean and Malayan forms, has one common, variable, wide-ranging Himalayan species (on which several others have been based), as well as four in the southern parts of India or in Ceylon. The Indian species of *Macrosilis* Pic (♂) and *Laemoglyptus* Fairm. (♂), named by Pic, have not been identified in the material before me. *Macrosilis* (1911) is represented in the British Museum by *M. laticollis* Boh. and *M. fortunei* Pic?, ♂ and ♀ in each case, and both inhabiting China; *Laemoglyptus* (1886), type *L. fissiventris* Fairm., type from Mou-Pin, China, was provisionally referred by its author to Drilidae: *L. subspinosus* Pic, from Formosa, a ♂ of which is before me, is a *Silis* (cf. antea, p. 205). Of *Rhagonycha* Esch., three Indian species of which have been named by Pic, there is a single unnamed representative from Sikkim in the British Museum. Three more *Silis*, subsequently detected in the same collection, are added in the present paper.

The species enumerated are as follows:—

<i>Silis hampsoni</i> , n. sp.	<i>Lycocerus maculicollis</i> Hope.
„ <i>tridentata</i> , n. sp.	„ <i>lineatocollis</i> Hope.
„ <i>incisa</i> , n. sp.	„ <i>miniatus</i> , n. sp.
<i>Rhagonycha tongluensis</i> , n. sp.	„ <i>lateritius</i> Gorh.
<i>Tylocerus lividus</i> Hope.	„ <i>cordieri</i> Pic.
„ „ <i>v. bimaculatus</i> Hope.	„ <i>pyrochroides</i> , n. sp.
„ „ <i>v. bispilatus</i> Hope.	„ <i>caliginosus</i> Gorh.
„ <i>hispidus</i> , n. sp.	„ <i>fumatus</i> , n. sp.
„ <i>manducatus</i> Gorh.	„ (?) <i>trilineatus</i> Pic.
„ <i>nigripennis</i> Gorh.	„ (?) <i>maculaticeps</i> Pic.
„ <i>dilutus</i> , n. sp. *	„ (?) <i>vittaticollis</i> , n. sp.
<i>Lycocerus coccineus</i> , n. sp.	„ (?) <i>karenensis</i> , n. sp.
„ <i>decipiens</i> Gorh.	„ (?) <i>variipes</i> , n. sp.

SILIS Latreille.

(Continued from p. 208.)

Silis hampsoni, n. sp.

♂. Elongate, narrow, shining, black, closely cinereo-pubescent, the head and prothorax minutely, the elytra rugulosely, punctured. Head nearly as wide as prothorax, the eyes small; antennae long, pectinate. Prothorax strongly transverse, uneven, deeply notched at the sides towards the base, the notch preceded by a longitudinally-grooved, almost smooth, parallel-sided, lateral dilatation, and limited behind by a short angular tooth. Elytra broader than prothorax, parallel. Legs slender.

* Continued from p. 210 antea.

♀. Broader; eyes smaller; antennae shorter, sharply serrate; prothorax simply constricted at base, the hind angles sub-rectangular.

Length $5\frac{1}{2}$ –7 mm.

Hab. Nilgiri Hills (*Sir G. F. Hampson, Dr. T. V. Campbell*).

Five ♂♂, two ♀♀. Narrower and more elongate than the Himalayan *S. ramifera* Champ. (*antea*, p. 204); the prothorax differently shaped in both sexes; the antennae sharply serrate and longer in ♀, and with longer rami in ♂.

Silis tridentata, n. sp.

♂. Moderately elongate, rather broad, shining, fusco-pubescent, black, the prothorax and mandibles testaceous; sparsely, minutely punctulate, the elytra rugulose, without trace of costae. Head (with the large prominent eyes) as wide as prothorax. Antennae long, stout, sharply serrate, joints 3–10 each produced into a rather long, oblique ramus at their inner apical angle. Prothorax strongly transverse, uneven, sharply bidentate on each side in front of the basal constriction (the lower tooth long, straight, and slender), the hind angles also produced into a long narrow tooth. Elytra long, broader than the prothorax, parallel.

♀. Antennae shorter, filiform, rather stout; eyes smaller; prothorax sinuate at sides, constricted in front of the sharp hind angles.

Length $5\frac{1}{2}$ mm.

Hab. N. Kanara (*T. R. Bell, ex coll. Andrewes*).

One pair. The ♂ is separable from that of the allied Indian forms by the sharply tridentate prothorax and the triangular antennal joints 3–10, each of which is produced into a rather long oblique ramus at apex; the ♀ has filiform antennae.

Silis incisa, n. sp.

♂. Elongate, rather broad, robust, shining, pubescent, testaceous; sparsely, minutely, the elytra rugulosely, punctured. Head (with the large, prominent eyes) nearly as broad as prothorax; antennae long, filiform, rather stout. Prothorax transverse, somewhat convex, broadly, sub-angularly dilated on each side at about the middle, and with a narrow, deep, curved notch on the upper surface between this and the basal excision, the hind angles sharp. Elytra long, parallel, wider than prothorax. Legs rather stout.

Length 8–9 mm.

Hab. Tavoy and Mergui, Tenasserim (*Doherty*).

Two ♂♂. Larger than *S. simplex* Gorh., the prothorax more dilated, the curved lateral notch confined to the dorsal surface, and not preceded by a definite tooth. *S. ceylonica* Bourg. (1905), type from Kandy, an insect also occurring in the Nilgiris (*Hampson*), has the elytra broadly black at apex, etc.

RHAGONYCHA Eschscholtz.

Rhagonycha tongluensis, n. sp.

♂. Elongate, narrow, pubescent, shining; black, the mandibles, basal, apical, and lateral margins of prothorax, and elytra testaceous; head closely, finely, prothorax very sparsely, and elytra coarsely, confluent, punctured,

the last-named without trace of costae. Head rather long, slightly narrowed posteriorly, the eyes small; antennae long, moderately stout. Prothorax subquadrate, about as long as broad, gradually narrowed from near base, deeply sulcate down the middle. Elytra elongate, sub-parallel, much wider than prothorax. Tarsal claws each sharply toothed beyond middle.

♀. Antennae a little shorter and more slender; prothorax broader behind, sub-transverse, fusco-maculate on disc; elytra broader.

Length $6\frac{1}{2}$ –7 mm.

Hab. Sikkim, Tonglu-Phalut, alt. 10,000–12,000 ft. (*H. Stevens* : xi, 1920).

One pair. Not unlike the European *R. limbata* Thoms., but larger and with very rugose elytra.

TYLOCERUS Dalman.

Lacordaire's definition of this genus must have been taken in part from fully-developed ♂♂ (which in some species have the antennae inserted upon prominent frontal tubercles), and the 'crochets simple' apply to ♀♀ only, the tarsal claws of ♂♂, in both Antillean and Eastern forms, having one of those of each foot thicker than the other and cleft down the middle as in the same sex of *Discodon* Gorh. An examination of all the available Indian material shows that five species only are present, one of which is extremely variable in the colour of the elytra and limbs and in the development of the ♂ antennae. Three of those named by Pic are unrecognizable from the imperfect diagnoses given.

The ♂♂ of the five species known to me may be tabulated thus :—

Antennal joints 1 and 11 elongate, both very stout in fully-developed examples; eyes small; elytra variable in colour.

113 Elytra not setose; antennae long, stout; legs shorter and stouter.

124 *lividus* Hope.

Elytra setose; antennae still longer and more slender (joint 1 excepted), joints 2–11 gradually thickened, 11 elongate; legs long and slender.

..... *hispidus*, n. sp.

Antennal joint 1 shorter, piriform.

Eyes large; elytra with black apical patch *manducatus* Gorh.

Eyes small.

Elytra infusate or black; antennae stouter, joints 11 longer than 10.

..... *nigripennis* Gorh.

Elytra dilute testaceous; antennae slender, filiform, joint 11 not longer than 10. *dilutus*, n. sp.

Tylocerus lividus Hope.

Anisotelus lividus, *bimaculatus* and *bispilotus* Hope, in Gray's Zool. Misc. 1831, p. 26.

*Tylocerus bimaculatus*¹ (Hope), Royle's Himal. Ins., p. 55, t. 9, fig. 9; Koll. et Redt. in Hügel's Kaschmir, iv, 2, p. 511,

t. 24, fig. 7; Bourg. Compt.-Rend. Soc. Ent. Belg. xxxv, p. cxxxviii (♂ ♀) (1891); Gorh. Ann. Soc. Ent. Belg. xxxix, p. 310 (1895).

Anisotelus latemaculatus Pic, L'Echange, xxxiv, p. 19 (1918).

Var. Antennae (except joint 1 at base) and elytra (except along the sides anteriorly) black. [Mus. Brit. and Mus. Oxon.]

Hab. Kashmir, Punjab, Nepal, United Provinces, Kurseong, Bengal, Sylhet, Assam, Burma, etc.

A common and widely distributed Indian insect, ranging eastward to Assam and Burma. Bourgeois has called attention to the variation in development of the ♂-antennae, the elongated basal and apical joints being enormously thickened in some examples and in others not much stouter than in ♀, much as in the Himalayan *Lytta antennalis* Mars. The typical immaculate form is local; the variety with black elytra (♂ ♀) occurs in the Kangra Valley and at Pegu and elsewhere. The eyes are small in both sexes. The black subapical spot or patch is sometimes extended over the whole of the elytral surface, and the antennae are sometimes entirely infuscate. The more elongate basal joint of the latter separates the dark form from *T. nigripennis* Gorh. The maculate forms of *T. lividus* have been sent me in plenty from Kumaon.

Tylocerus hispidus, n. sp.

♂. Elongate, rather dull, finely pubescent, the elytra also set with short, erect, stiff black setae; testaceous, the antennae (joint 1 excepted), tarsi, posterior tibiae in their outer half, and a large apical patch on elytra extending broadly forward to about middle (wanting in one specimen) black or infuscate. Eyes small, prominent; antennae nearly as long as body, joint 1 very stout, elongate-oval, 2-11 gradually thickened, 2-8 rather slender, 2 slightly longer than 3, 9-11 stouter, 11 much longer than 10, acuminate. Prothorax broad, strongly transverse, the sides rounded anteriorly and sub-parallel towards base, the hind angles slightly projecting, the oblique lateral plica feeble. Elytra long, densely, minutely punctulate and sparsely granulate. Legs long, comparatively slender, joint 1 of posterior tarsi about as long as 2-5 united.

Length (excl. head) 8-9 mm.

Hab. CEYLON (Mus. Brit., ♂, pallid var.), Woodside, Umgalla (ex Mus. Colombo: maculate ♂: type).

The above description is taken from two ♂♂ in the British Museum. Separable from all the varieties of *T. manducatus* Gorh. by the small eyes, the very long, slender (the stout joint 1 excepted), outwardly-thickened antennae, the hirsute, granulate elytra, and the long, slender legs, the basal joint of the posterior tarsi very elongate.

Tylocerus manducatus Gorham.

Telephorus manducatus Gorh., P.Z.S. 1889, p. 100 (♀)¹; Ann. Soc. Ent. Belg. xxxix, p. 313 (1895) (♂ ♀).²

Tylocerus apicalis Bourg., Ann. Soc. Ent. Fr. 1903, p. 479 (♂ ♀),³ 1905, p. 129 (♀).⁴

Hab. INDIA,¹ Belgaum,² Poona,² Central Provinces and Kanara (*Mus. Brit.*); CEYLON, Kandy, etc.,³ Nalanda.⁴

Var. Antennae, apices of femora, tibiae in part, tarsi, and a short apical patch on elytra, black (♂ ♀). [*? atroapicalis* Pic.]

S. INDIA, Chikkaballapura (*T. V. Campbell*).

There is a long series of this species in the British Museum, including many from Ceylon. Bourgeois³ described the two sexes in detail; but on comparing his insect with the variable *T. lividus* (*bimaculatus*) Hope, he omitted to note that in the ♂ of his species the eyes are very much larger and more widely separated. The prothorax is less dilated anteriorly. The elytral surface, too, is smoother, more shining, and sparsely setose, and the antennae are more slender in both sexes, the fully-developed ♂ having the basal joint piriform and the apical one not or very little longer than the tenth. The Poona specimens have darker legs, like those of the variety mentioned. *T. atroapicalis*, *khurdanus* and *ceylonicus* Pic (1917), no sex for which is given, appear to be forms of this S. Indian and Ceylon insect.

Tylocerus nigripennis Gorham.

Tylocerus nigripennis Gorh. Ann. Soc. Ent. Belg. xxxix, p. 311 (♂) 1895.¹

♀. Antennae short, not so stout; prothorax less dilated at sides.

Var. Femora and tibiae (except towards apex) testaceous.

Tylocerus fumipennis Gorh. loc. cit. (♂ ♀).²

Var. Head usually with the basal half or more, elytra (except the outer margin or suture in some examples), and legs in part, black; elytra smoother, without trace of costae; antennae (♂ ♀) as in *T. nigripennis*, joint 3 much longer than 2.

Hab. INDIA² (*Mus. Oxon*), Belgaum and Kanara,¹ Haldwani (*H.G.C.* : ♂), Bengal³ (*Mus. Brit.*), CEYLON (*Fletcher* and *Mus. Brit.* : ♀).

This insect is of about the size of the narrowest and smallest *T. lividus*, and the ♂ has a shorter and less cylindrical basal joint to the antennae. The legs vary in colour, as in *T. manducatus*. The eyes are small in both sexes. The three males taken at Haldwani belong to the var. *fumipennis*. Females only seen from Ceylon.

Tylocerus dilutus, n. sp.

♂. Moderately elongate, shining, finely pubescent; testaceous, the elytra paler, the basal half of head, antennae (except joint 1 in part), eyes, the apex of elytra in one specimen, metasternum and legs (except femora to near apex),

infusate or black; the head and elytra closely, minutely, the prothorax very sparsely, punctulate. Head narrower than prothorax; eyes small; antennae filiform, long, slender, joint I piriform, II not longer than 10. Prothorax strongly transverse, dilated laterally, as wide as elytra, gradually narrowing from the base, the outer portions of basal margin oblique. Elytra comparatively short, without definite costae. Seventh ventral segment cleft down middle. Legs rather slender; tarsi each with one claw a little stouter than the other and feebly cleft at tip.

Length 5½–6 mm.

Hab. INDIA (*Mus. Brit.*), Nilgiris (*Downing* : type).

Two ♂♂. A small form separable from *T. nigripennis* Gorh. by the dilute testaceous, rather short elytra, and the slender filiform antennae of the ♂. Several similarly-coloured specimens taken in the Anamalai Hills and at Malabar (*Mus. Brit.*) have both the tarsal claws uncleft at tip in ♂, and these must belong near *Silis*.

LYCOCERUS Gorham.

Lycocerus Gorham, P.Z.S. 1889, p. 108; Fairmaire, Compt. Rend.

Soc. Ent. Belg. xxxv, p. ccviii (1891); Bourgeois, Ann. Soc.

Ent. Belg. li, p. 103 (1907).

Gorham included five new species under this genus, four of which are Indian, but the characters he gives for it exclude two of them, and he could not identify the sex of the first one, *L. serri-cornis*; it would be better, therefore, to take the Chinese *L. militaris* (= *pluricostatus* Fairm.) as the type. 'The typical Lycid-like forms have broadly serrate or subimbricate joints to the antennae, at least in ♀, while these organs are filiform in *L. decipiens* Gorh. and *L. atriceps* Bourg.; the ♀♀ always have one or two of the tarsal claws hamate at base. In *L. decipiens* and *L. coccineus* the prothorax is almost immarginate laterally and parallel-sided or even narrowed towards base, one of these insects having extremely long filiform antennae and the other these organs very broadly widened. The ♂♂ of most of them are rare. Till the actual types can be examined and the sexes identified the various forms described by Pic must remain under the one genus, *Lycocerus*. *L. atriceps* Bourg., *L. trilineatus* and *maculaticeps* Pic, and *L. vittaticollis*, *karenensis* and *L. variipes* Champ. (infra), would perhaps be better placed under *Athemus* Lewis, leaving the Lycid-like forms (*L. pluricostatus* Fairm., *L. decipiens* Gorh., *L. coccineus* Champ., etc.) to a restricted group, *Lycocerus* s. str. These insects appear to be particularly numerous in Burma, and the numerous forms obtained by Doherty in that region (*ex coll. Fry*) have been included in the present study.

(To be concluded.)

(a) Prothorax widened anteriorly or subcylindrical.

Lycocerus coccineus, n. sp.

♀. Broad, elongate, the elytra sub-arcuately dilated from a little below the base to apex; dull, scarlet above, the anterior half of head, antennae, legs, and under-surface black, the wings smoky-black; the upper surface densely, the front of head very sparsely, pubescent, the close fine puncturing of the basal half of head and of the prothorax hidden by the vestiture, the elytra rugulose and each with five costae on disc, 3 and 5 becoming more or less coalescent posteriorly. Head narrower than prothorax, the eyes rather small; antennae long, joint 2 short, 3-11 extremely broad, sub-imbricate at base, blunt at tip, tapering towards apex, 3-10 about as broad as long. Prothorax transverse, the sides rounded and somewhat dilated anteriorly, becoming parallel towards base; sulcate down middle and obliquely depressed towards the sides anteriorly, the lateral margins becoming obsolete posteriorly. Elytra elongate, abruptly widened from a little below the base, at middle at least twice as wide as prothorax. Sixth ventral segment emarginate in centre behind. Anterior tarsi with one claw hamate, and the intermediate tarsi with one claw angulate, at base.

Length (excl. head) 15-18 mm., breadth 6½-8. mm.

Hab. N. BURMA, Ruby Mines (*Doherty*).

Seven ♀ ♀. Very like a large scarlet Lycid or *Pyrochroa*, and allied to the Chinese *L. pluricostatus* Fairm. (= *militaris* Gorh.). The antennae are even broader than in same sex of *L. lateritius* Gorh. The lateral margins of the prothorax are almost wanting. The elytra are more dilated than in *L. maculicollis*.

Lycocerus decipiens Gorham.

♂. *Lycocerus decipiens* Gorh. P.Z.S. 1889, p. 109; Ann. Soc. Ent. Belg. xxxix, p. 313 (1895).

♂. Antennae filiform, becoming more slender towards tip, nearly reaching the apex of elytra, joint 2 fully half the length of 3; head (with the large prominent eyes) much broader than prothorax; prothorax narrow, longer than broad, parallel-sided, narrowly deeply sulcate down the middle; femora and tibiae very thickly clothed with long, fine, projecting hairs, the antennae with a few similar hairs.

♀. Antennae shorter, joint 2 more than half the length of 3; eyes not quite so large; prothorax shorter, sub-quadrate; ventral segment 6 emarginate at middle behind.

Hab. N. INDIA, Dibru and Naga Hills (*types of Gorham*), Gopaldhara, Sikkim (*H. Stevens* : ♂), Mungphu (*Mus. Brit.* : ♀), Khasia Hills (*Godwin-Austen* : ♂).

Separable from its allies by the large eyes in ♂, the very long filiform antennae, nigro-lineate head and prothorax, the latter parallel-sided, and the very hairy legs, a character not mentioned by Gorham. The elytra are rugulose throughout and conspicuously bicostate on the disc. The prothorax is almost immarginate laterally.

(b) Prothorax narrowed anteriorly.

Lycocerus maculicollis Hope.

'Sanguineus, thorace nigro-maculato, corpore subtusque nigro' (Hope).

♂ ♀. *Omalysus maculicollis* Hope, in Gray's Zool. Misc. 1831, p. 26.

? ♀. *Lycocerus serricornis* Gorh. P.Z.S. 1889, p. 109, pl. 12, fig. 10.

Var.? *Lycocerus ruficeps* Pic, Mélanges exot.-entom. xiii, p. 3 (1915).

♂. Antennae very long, about reaching the middle of elytra, joints 3-11 dilated, moderately serrate, gradually tapering towards tip, each at least twice as long as broad, 3 a little shorter than 4, 5 hollowed on inner edge; head narrower than prothorax, the eyes not very large.

♀. Antennae much shorter, joint 3 triangular, 4 and following joints oblong, longer than broad, broader than in ♂ and more rapidly tapering towards tip; head as in ♂; terminal (exposed) ventral segment emarginate in centre at apex; anterior tarsi with one of the claws armed with a long tooth, and the intermediate tarsi with one of the claws with a shorter tooth at base.

Length 14-17 mm.

Hab. Nepal (type, ♀, in *Mus. Brit.*; co-type, ♂, in *Mus. Oxon*); Assam (*Mus. Brit. and coll. Gorham*).

Six specimens of this species are contained in the collections before me, most of them faded and in bad condition. *L. maculicollis* is the largest of the Himalayan *Lycoceri*, and recognisable by its bright red upper surface, the head (a transverse pubescent reddish space at base excepted), a median vitta of variable width (broad and mesially dilated in type) on the prothorax, the antennae, scutellum, legs and under surface black. The lateral margins of the prothorax are not reflexed. The elytra are feebly costate on disc. *L. ruficeps* Pic, from the Himalaya, is probably a variety of the same species, the head being partly red or ochraceous in the types of both Hope and Gorham.

Lycocerus lineatocollis Hope.

'Praecedenti [*O. maculicollis*] similis magnitudine, lineâque tenui longitudinali nigra, et pedibus brunneo ferrugineis differt. Long lin. 6; lat. 2' (Hope).

♀. *Omalysus lineatocollis* Hope, in Gray's Zool. Misc. 1831, p. 26.

Hab. Nepal (type, ♀, in *Mus. Brit.*).

There are three ♀ ♀ standing under this name in the British Museum and another of the same sex in the Oxford Museum. The type (now wanting antennae) is smaller and narrower than *L. maculicollis*, ♀, and is testaceous in colour, with a space between the eyes, a narrow vitta on prothorax, the scutellum, under surface and tarsi black, the femora and tibiae partly testaceous;

the prothorax subconical; about as long as broad, strongly constricted anteriorly, deeply sulcate down the middle, and with the lateral margins feebly reflexed. Two of the other specimens seem to belong to *L. cordieri* Pic (1915), and one (that at Oxford), with more strongly costate elytra, to *L. maculicollis*.

Lycocerus miniatus, n. sp.

♂. Broad, elongate, moderately shining, closely pubescent, with longer hairs intermixed; scarlet above, the anterior half of head, a short narrow streak on prothorax, antennae, legs, and under-surface black, the scutellum piceous; closely, finely, the elytra rugulosely, punctured, the latter granulate throughout and obsoletely bicostate on disc, the anterior half of head almost glabrous and very sparsely punctate. Head narrower than prothorax, the eyes moderately large; antennae about reaching the middle of elytra, tapering, joint 2 very short, 3-11 flattened, elongate, 3-8 much wider than the rest. Prothorax broader than long, narrowing from base, sulcate down middle behind and angularly depressed towards the sides anteriorly, the anterior angles rounded. Elytra elongate, somewhat explanate laterally (appearing narrowed at base). Legs stout, hairy. Ventral segment 6 bi-angulate at apex, leaving the terminal one exposed.

Length 15 mm., breadth 6 mm.

Hab. TENASSERIM, Tavoy (*Doherty*).

One ♂. A large, broad form allied to *L. maculicollis* Hope, with bright scarlet upper surface (the front of the head and a short streak on the prothorax excepted), the antennal joints 3-8 widened, oblong, parallel-sided, not serrate, the prothorax smoother, the elytra granulate.

Lycocerus lateritius Gorham.

♀. *Lycocerus lateritius* Gorh. P.Z.S. 1889, p. 109.

♂. Antennae extremely elongate, broad, strongly serrate; head hollowed between the eyes, and (with them) as broad as or broader than base of prothorax, the eyes very large and prominent; prothorax narrow, conical; terminal (covered) ventral segment with a flattened lobe arising from each side of the central emargination, the corresponding dorsal segment with much longer, strongly curved ciliate lobes.

♀. Antennae much shorter and broader, joints 3-8 very broad, less angulate at tip, and sub-imbricate at base; head broader; eyes much smaller; prothorax broader and more transverse; ventral segment 6 triangularly emarginate at tip.

Length 12-14 mm.

Hab. INDIA (*coll. Gorham*), Rungbong Valley, Gopaldhara, Sikkim (*H. Stevens*: ♂ ♀), Tsuntang, Sikkim (*Major Hingston*: ♂), Munghphu (*Mus. Brit.*: ♀).

Found in abundance in Sikkim, the ♂ being apparently rare, four only (two of which have been dissected) having been found in the long series examined. Discoloured ♀ examples agree fairly well with Gorham's description. Fresh specimens are bright red in colour, and in some of them the prothorax has a black median

vitta. Compared with the insect here referred to *L. cordieri* Pic, the present species may be known by the very large eyes and narrower prothorax in ♂, and the still more broadly dilated antennae in ♀. The elytra are rough and subgranulate, and bicostate on the inner part of the disc. A broken ♀ from Margherita, Assam (*Mus. Brit.*), may belong to the same species.

Lycocerus cordieri Pic.

♀. *Lycocerus cordieri* Pic, L'Echange, xxxi, p. 15 (1915)?

♂. Elongate, rather narrow, feebly shining, thickly ochraceo-pubescent, and with longer hairs intermixed; ochraceous or brick-red, the antennae (except at base), a space between the eyes (sometimes extending down the middle to base), an evanescent median line or vitta on prothorax, scutellum, under-surface, and legs piceous or black, the femora and tibiae sometimes obscure testaceous; the head and prothorax very finely, closely punctured, the elytra sub-granulate, densely rugulose, and with two faint costae on disc. Head (with the moderately large prominent eyes) a little wider than front of prothorax; antennae extremely elongate, joint 2 small, 3-9 dilated, tapering, strongly serrate, 10 and 11 narrow. Prothorax rather narrow, conical, constricted anteriorly, sulcate down middle posteriorly, feebly margined laterally. Elytra elongate, wider than prothorax. Terminal (covered) ventral segment with a narrow flattened lobe arising from each side of the central emargination, the corresponding dorsal segment with much longer curved ciliate lobes.

♀. Antennae shorter, joints 3-9 less produced at inner apical angle; head and prothorax reddish, the latter sometimes with a dark median line; prothorax broader and more transverse, less constricted anteriorly. Ventral segment 6 triangularly emarginate in centre.

Length 11-13 mm.

Hab. INDIA, Kakhar [Cachar] and Nepal (*Mus. Brit.*: ♀ ♀), W. Almora, Ranikhet, and Sunderdhunga in Kumaon (*H.G.C.*: ♂ ♀), Mussoorie (*type of Pic*: ♀).

The above description is taken from five ♂♂ (three of which have been dissected) and four ♀♀ from Kumaon, the ♀♀ from the other localities apparently belonging to the same species. *L. lineatocollis* Hope, type ♀, has a longer and narrower prothorax than the same sex of the present species. *L. ruficeps* Pic (length 18-19 mm.), type ♀?, is a much larger insect. The sex of the type of *L. cordieri* was not stated in the diagnosis given. The colour of the upper surface is variable, according to the age and condition of the specimen. *L. indicus* Pic (1921) must come very near the present insect.

Lycocerus pyrochroides, n. sp.

♂. Elongate, narrow, somewhat widened posteriorly; densely, finely pubescent, with longer hairs intermixed; black, the head on each side in front and mandibles testaceous, the prothorax and elytra brick-red or ochraceous, the red pubescence extending over the basal half of head; the head and prothorax closely, finely, the elytra rugulosely, punctured, the last-named bi-costate on

disc. Head narrower than prothorax, the eyes moderately prominent; antennae extremely long, broadly dilated and sharply serrate from joint 3 onward, tapering towards tip, 3-11 elongate, 2 very short. Prothorax broader than long, sub-conical, sulcate on disc and nodose on each side of this posteriorly, feebly margined at sides. Elytra elongate, broader than prothorax. Terminal (covered) ventral segment with long flattened lateral lobes, the corresponding dorsal segment with longer, spoon-shaped, ciliate lobes.

♀. Broader; antennae much shorter, joints 3-11 still more dilated, 3-7 about as broad as long; prothorax more transverse, trapezoidal; anterior and intermediate tarsi with one of the claws hamate at base.

Length $9\frac{1}{2}$ -14 mm.

Hab. N. BURMA, Ruby Mines (*Doherty*).

Four ♂♂ and six ♀♀, one of the latter much larger than the rest. Near the Indian *L. lateritius* Gorh. (as here identified), the ♂ with much smaller eyes, the ♀ with the antennal joints 4-8 very broad, shorter and less oblique, and the prothorax less constricted anteriorly. The non-vittate prothorax and the more dilated antennae separate the present species from *L. vittaticollis*, infra. An unnamed ♀ specimen from Assam is closely related to it.

Lycocerus caliginosus Gorham.

♀. *Lycocerus caliginosus* Gorh. P.Z.S. 1889, p. 110, pl. 10, fig. 11.

Hab. INDIA (coll. Gorham), Assam (*Mus. Oxon, ex coll. Atkinson*).

There is a ♀ of this species in the Oxford Museum. A very elongate smoky-black insect, with the sides of the prothorax broadly, and the humeral callus, rufous, the margins of the elytra testaceous, the anterior and intermediate tarsi each with one of the claws hamate at base.

Lycocerus fumatus, n. sp.

♀. Elongate, rather broad, opaque, densely clothed with fine ochraceous pubescence, that on the basal half of the head fiery-red, with scattered longer hairs intermixed; black, the lateral margins of prothorax anteriorly or entirely rufous, the sides of the head in front, mandibles, and lateral margins of elytra testaceous; head and prothorax densely, minutely, the elytra rugosely punctured, the last-named obsoletely or distinctly bi-costate on disc. Eyes small. Antennae moderately long, joints 3-11 longer than broad, 3-9 greatly dilated, sub-serrate, 10 and 11 narrowed. Prothorax transverse, narrowed from base, trapezoidal, feebly margined at sides. Elytra elongate, broader than prothorax, somewhat dilated laterally. Anterior and intermediate tarsi each with one of the claws strongly hamate.

Length $9\frac{1}{2}$ -11 mm.

Hab. N. BURMA, Ruby Mines (*Doherty*).

Two partly abraded ♀♀. Separable from the same sex of *L. caliginosus* Gorh. by the dense puncturing of the upper surface;

the very broadly dilated, serrate, tapering antennae; the short prothorax, with the margins or anterior angles only rufous; and the less elongate, broader elytra, with less prominent, densely punctured humeri. The dark colouring of the upper surface is disguised by the close fine ochraceous pubescence.

Lycocerus (?) *trilineatus* Pic.

Lycocerus trilineatus Pic, *Mélanges exot.-entom.* xxxiv, p. 5 (October, 1924).

♂. Antennae very long, extending to beyond middle of elytra, joint 2 small, 3-11 elongate, 3-7 wider than those following; head obliquely narrowed behind, black, with a reddish spot on vertex, the eyes very large and prominent; prothorax narrow, obsoletely margined at sides, gradually narrowed from base, testaceous, with a median vitta or patch of varying development, and usually the lateral margins also, black; elytra elongate, testaceous, sub-granulate, obsoletely costate; legs and under-surface infusate or black; terminal (covered) ventral segment with short lateral lobes, the corresponding dorsal segment with concave, curved, longer, ciliate lobes.

♀. Antennae much shorter, joints 3-7 broader; eyes much smaller; prothorax a little broader.

Var. ♀. Prothorax and elytra (the outer half or margins of latter excepted) infusate or black, the dark coloration partly hidden by the ochraceous pubescence; the head with the usual reddish spot.

Length 8-11½ mm.

Hab. INDIA (type in coll. Pic), Gopaldhara, Sikkim (*H. Stevens* : ♂ ♀), Singhik, Sikkim (*Major Hingston* : ♂ ♀), Phoobsering, Lebong, Bengal (*Mus. Brit.* : ♂ ♀).

This common Sikkim insect is doubtless referable to *L. trilineatus* Pic, as it is the only Indian one to which his diagnosis would apply. The dark variety of the ♀ has the elytra coloured as in *L. caliginosus* Gorh.; it occurred in both the Sikkim localities quoted. Other large ♀ ♀ from the same region with the head in great part red belong here or to *L. variipes*. Specimens of the two sexes were obtained in three of the localities quoted. *L. harmandi* Pic (1921) (type ♀ ?), from Darjeeling, has the head and a median line only on prothorax black: it is probably a form of the same species.

Lycocerus (?) *maculaticeps* Pic.

Lycocerus maculaticeps Pic, *Mélanges exot.-entom.* xxxiv, p. 5 (1924).

Var. ? ♀. Head wholly rufous.

Hab. INDIA, Darjeeling (type of Pic), Gopaldhara, Sikkim (*H. Stevens*), Kurseong (*Mus. Brit.*).

Females from Gopaldhara, near Darjeeling (length 8-10 mm.), agree with Pic's diagnosis, presumably based on specimens of the

same sex. The vestiture is redder than in the ♀ of *L. trilineatus*, and the prothorax is almost immaculate, otherwise no difference is apparent between them. It is a curious fact that these insects, as well as *L. variipes*, *lateritius* and *decipiens*, have all been found in the same valley in Sikkim.

Lycocerus (?) *vittaticollis*, n. sp.

♂. Elongate, narrow, parallel-sided, shining, finely pubescent, with longer hairs intermixed, these latter forming a small tuft at the hind angles of prothorax; black, the prothorax (a median vitta excepted) and elytra (except the sutural margin anteriorly in some specimens) brick-red, the mandibles testaceous; head closely, prothorax sparsely, and elytra rugulose, punctured, the last-named bi-costate on disc. Head obliquely narrowed behind the eyes, the latter large and prominent; antennae long, tapering, joint 2 short, 3-11 elongate, 3-7 slightly widened. Prothorax sub-conical, about as long as broad, constricted anteriorly, sulcate down middle posteriorly, hollowed on each side at base and apex, obliquely plicate in front of the prominent hind angles, and feebly margined at sides. Elytra elongate, broader than prothorax.

♀. Eyes less prominent; antennae much shorter, joints 3-7 broadly widened, 3 triangular, all longer than broad; prothorax transverse, trapezoidal, not plicate near hind angles; anterior and intermediate tarsi with one of the claws hamate at base; ventral segment 6 triangularly emarginate.

Length $8\frac{1}{2}$ - $12\frac{1}{2}$ mm.

Hab. N. BURMA, Karen Mts. and Ruby Mines, alt. 5,000-7,000 ft. (*Doherty*).

Two ♂♂, twelve ♀♀, varying greatly in size, the colour fading to ochraceous in some of them. A close ally of the S. Indian *L. atriceps* Bourg., the prothorax with a sharp, black median vitta (as in *L. maculicollis* Hope); the ♂ with the prothorax itself longer, narrower and subconical, with less rounded anterior angles; the ♀ with the intermediate antennal joints broadly widened.

Lycocerus (?) *karenensis*, n. sp.

♂. Smaller and narrower than *L. vittaticollis*; closely pubescent, black, the head in the middle above, prothorax (a narrow, evanescent median vitta excepted) and elytra brick-red, the mandibles testaceous. Head small, the eyes prominent but not so large as in *L. vittaticollis*; antennae elongate, rather broad, sub-serrate, tapering, joints 3-8 moderately widened. Prothorax conical, compressed at the sides anteriorly, sulcate down middle, the median vitta reduced to a narrow streak. Elytra elongate, narrow, becoming narrower towards apex.

♀. Broader; antennae shorter, the joints 3-8 more broadly widened; prothorax transverse, trapezoidal; elytra sub-parallel.

Length 6-6½ mm.

Hab. BURMA, Karen Mts. (*Doherty*).

Two ♂♂, six ♀♀. A small form of *L. vittaticollis* requiring a distinctive name. It is very like one of the insects here treated as a variety of *L. trilineatus* Pic, the ♂ of which has larger eyes, and the antennae longer and less tapering.

Lycocerus (?) *variipes*, n. sp.

♂. Elongate, narrow, shining, finely pubescent and also thickly set with long, soft, pallid hairs (which give a ciliate appearance to the sides of the prothorax); testaceous, the antennae (except at base), tarsi, and usually the intermediate and posterior femora and tibiae in part, black, the prothorax often with an incomplete dark median line; the head and prothorax very finely, the elytra densely, rugulosely, punctured, the last-named granulate and without definite costae. Head broad, the eyes moderately large and rather prominent; antennae extremely long, tapering, joint 2 very short, 3-11 elongate, flattened, 3-7 broader than those following. Prothorax as long as broad, gradually narrowing from base, sulcate down middle posteriorly, narrowly margined at sides. Elytra elongate, broader than prothorax. Legs rather stout, the femora thickened. Terminal (covered) ventral segment with long narrow lateral lobes, the corresponding dorsal segment also with long concave lobes which are hooked at tip.

♀. Antennae, a spot on the epistoma, an incomplete line on prothorax, scutellum, under-surface and legs infusate or black; tarsi each with one claw setose and angulate at base, as in ♂.

Var. Head infusate behind eyes in ♂, testaceous in ♀. [Mungphu.]

Length $8\frac{1}{2}$ -9 $\frac{1}{2}$ mm.

Hab. Rungbong Valley, Gopaldhara, Sikkim (*H. Stevens* and *W. K. Webb*: type ♂; ♀), Mungphu (*ex coll. Atkinson*: ♂ ♀), Sarju Valley, Kumaon (*H.G.C.*: ♂).

Males of this species were found in plenty with *L. trilineatus* Pic in Sikkim; the females provisionally referred to it are only separable from those of the latter species by their immaculate reddish head. The description of *L. indicus* Pic (1921) nearly applies to the ♂; but the length given (12 mm.) and dark scutellum make the identification doubtful, no sex being mentioned by the author. *L. variipes* is nearly related to *L. atriceps* Bourg., from the Nilgiris, etc., and is therefore referred to *Lycocerus*.

Horsell,

September 1926.

Odonata at Wicken Fen.—Whilst collecting Coleoptera and Diptera in Wicken Fen at the end of July I captured the following dragonflies. One of these, *Sympetrum flaveolum* has not, I think, been captured in this locality before, though Mr. Lucas mentions it as a possibility in 'The Natural History of Wicken Fen,' Part II.

Sympetrum striolatum Charp., moderately common; *S. flaveolum* Linn., 1 ♂; *S. sanguineum* Müll., very common; *Libellula 4-maculata* Linn., 1 ♀, very worn; *Brachytron pratense* Müll., 1 ♂, also very worn; *Aeschna grandis* Linn., common, but very difficult to approach; *Lestes sponsa* Hansem, very common; *Agriion puella* Linn., common; *A. pulchellum* Lind., common; *Ischnura elegans* Lind., a few specimens, mostly teneral; *Enallagma cyathigerum* Charp., common.

I did not find a single *Pyrrhosoma nymphula*, much to my surprise.—W. B. Maxx, 9 Grange Avenue, Leeds: October 7th, 1926.

THE ORIGIN AND DISTRIBUTION OF THE COAST COLEOPTERA OF THE BRITISH ISLES.

BY GEO. B. WALSH, B.SC.

(Concluded from p. 231.)

Thus one would conclude that, assuming the south-western origin of the truly littoral Coleoptera, there would be complete colonisation, within the limits of available habitats, of the south-west corners of England and Ireland, a more or less complete colonisation of the Irish coast diminishing in importance with distance from the district of entrance, colonisation of the west coast of Britain gradually becoming less pronounced as we go north and of the south coast as we go east, and finally a colonisation of the east coast which would be least definite in the south. Moreover, we should expect to find the Isle of Man, the Faroes and Norway carrying many of these species, whereas the coast of Germany and especially the Baltic coasts would be relatively poor.

That such a state of affairs actually holds in the case of marine organisms, more especially with those having free-swimming larvae but a more or less sedentary adult stage, has been shown to be true by Marion Newbigin.²⁷ Here the North Sea coast fauna has a markedly Northern facies, whereas that of the west coast is dominantly Southern in character, this being easily explicable on the score of carriage by ocean currents. This explains, moreover, the occurrence of 'Lusitanian' Coleoptera in northern haunts where there has almost certainly been no land bridge since the Glacial Epoch, *e.g.* the Faroes and Norway; and it gives, too, a feasible explanation of the occurrence of so many halophile species practically all round the Irish coast and also in the Isle of Man (*cf.* Balfour Browne⁷). It does not explain, however, the limit of occurrence of strictly littoral species at approximately equal latitudes on the east and west coasts of Britain: for example, of the apterous species *Aëpus marinus* Stroem, up to the Clyde on the west coast and the Forth on the east; but so little is known of the distribution of Coleoptera on the northern coasts of Scotland that the species may well occur there and so fill up the hiatus.

(d) ACTIVE LOCOMOTION BY THE INSECT. There is little doubt that this must play an important part in the spread of many insects, especially of those which run or fly readily. Little information seems to be available on the subject for the Coleoptera, but there is a growing store of facts for the Lepidoptera, *e.g.* Nicholson²⁸ on *Plusia moneta* Treits. Many shore insects are characterised by their inability or reluctance to fly, but it should

be noted that certain species, *e.g.* those that frequent brackish water, such as *Haliphus striatus* Sharp, are as much insulated in their particular haunts as are other species on a true island, and in these cases active flight, doubtless more or less assisted by the wind, would seem to be the best explanation of their dispersal. Further information is much to be desired on this subject, and good work can doubtless be done by watching the colonisation of hitherto unoccupied tracts, *e.g.* Füge's¹⁶ paper on the colonisation of a new island on the East Friesian coast.

VI. DISCONTINUOUS DISTRIBUTION.

This is usually regarded as a sign of advanced specific age and of retrogressive geographical distribution; but, however true this may be when considered as a general principle over a large area—and even here it does not always seem to fit the facts—or as a possible consequence of the activities of man, it certainly does not seem to apply in the case of the British littoral Coleopterous fauna, where the intervention of man has been relatively so small, and where the colonisation of the country since the Ice Age has been geologically so recent as to prohibit such clear-cut examples as we have here.

This discontinuity is of two kinds: (1) that of inland occurrence in isolated localities of species usually littoral; and (2) that of big gaps in coast distribution. Cases of the former have already been considered, and cases of the second are common enough. They may be put down to:—

(a) Lack of suitable habitats and food. This is due to the fact that our coast-line varies greatly in character, so that there are big gaps between localities where a species can find a suitable nidus. To take two simple and restricted examples, sand-dunes occur on the Yorkshire coast at Spurn, there is a small patch at Auburn two miles south of Bridlington, another near Whitby, and a further extensive area on the south shore of the Tees estuary; again, clay cliffs washed by the sea occur all along Bridlington Bay to Bridlington, then after a gap of some miles they reappear in Filey Bay, with short stretches in the North Bay, Scarborough, at Whitby, Runswick Bay and Saltburn. Yet in all suitable localities the clay-loving species *Nebria livida* Fabr. occurs, and is absent in localities between them.

(b) Isolated 'attempts' to break new ground, this applying especially to species capable of flight. These doubtless often ultimately fail, partly through climatic, edaphic, food or other conditions, and partly probably through inbreeding.

(c) Change of environment caused by the sea removing sand, shingle, etc., together with the necessary food, thus destroying parts of what were at one time continuous haunts. Avebury¹ says that at one time or another almost every portion of our south coast may be found in the condition of bare rock quite free from sand or shingle, and much the same thing occurs in our Scarborough bays.

VII. STABILITY OF FAUNA.

To the final question, 'Is advance still going on?' there seems little reason to doubt that 'the answer is in the affirmative.' W. E. Sharp³⁴ has suggested that no species now, unless under exceptional or non-natural conditions, is increasing or ever will increase its range,' and that 'since a point was reached somewhere in the past which marked the final equilibrium of the forces of dispersal and the stress of competition, most movement has been in the form of retrogression and due to human interference with environment.' It seems scarcely logical and scientific, however, to deny to *Homo sapiens* a place in the Britannic fauna, with all the implications that this involves (apart, possibly, from his *direct* introduction of species), and yet include *Formica rufa* as a constituent of a local fauna, and accept its effect on animal and vegetable life, from the point of view of both destruction and encouragement (whether active or passive) as a natural phenomenon. If, as believed by Wallace,³⁷ J. Geikie¹⁷ and C. Reid,^{29 30} the greater part or even the whole of our fauna is post-glacial in origin, man doubtless entered the country contemporaneously with it, and at a very early date commenced his modification of the vegetation covering the surface of Britain; so that his influence on our insect fauna would commence—to a very small degree, of course, at first, but gradually increasing in importance—practically at the date of his first advent in the country: so that it becomes impossible to say that at such and such a date his influence ceased to become natural or zoological, and became artificial and scientifically of little interest. Certain it is that within recent years many insects, as well as many other organisms, have materially extended their range, e.g. *Lathridius bergrothi* Reitt., *Ptinus tectus* Boield., *Asemum striatum* Linn., *Callidium violaceum* Linn., *Tetropium gabrieli* Weise, *Criocephalus polonicus* Mots., *Pissodes notatus* Fabr. (Donisthorpe¹²), *Stenopelmus rufinusus* Gyll. (Janson^{20A} suggests its introduction on the feet of birds), *Carpophilus 6-pustulatus* Fabr. (Beare³), *Coninomus nodifer* Westw. (Fowler¹⁵), etc. Some of these undoubtedly owe their spread more or less directly to

man's agency, but in other cases it is by no means so clear that this is the case; and any Coleopterist who has carefully worked a district which has previously been thoroughly studied cannot fail to be struck by the fact that the insect population is undergoing fairly rapid change as to its specific constitution, partly, of course, but by no means invariably or even in the main, in the direction of depletion. Certainly, in the Scarborough district, there are many species to be found quite commonly to-day which were not recorded by Lawson and Wilkinson in the sixties of the last century. Clement Reid,³⁰ in an address delivered to the British Association at Portsmouth in 1911, advocated very strongly the opinion that our plant population is not in a state of stagnation or gradual extinction, but that, on the contrary, it is being gradually increased by immigrants from the Continent, brought over by purely natural, as apart from human, agency; and there seems no reason whatever to doubt that exactly the same state of affairs holds with the Coleoptera.

VIII. SUMMARY.

1. Coast Coleoptera furnish useful criteria as to the origin and distribution of the British beetle fauna.
2. The majority are not strictly littoral, and probably came from the East.
3. The true littoral and especially the sub-maritime species probably came, a small group from the North and a relatively much larger group from the South and South-West.
4. This suggestion is supported by distribution of other terrestrial organisms.
5. Coast insect life was probably utterly destroyed in Britain during the Ice Age.
6. Dispersal was effected by (a) birds, (b) wind, (c) ocean currents, (d) insects' own efforts.
7. Discontinuous distribution of coast Coleoptera is largely due to discontinuity of suitable habitats.
8. Advance is probably still going on.

IX.

My best thanks are due to Messrs. J. M. Brown and J. E. Collin and Dr. W. E. Collinge for the information in this paper on their respective special groups, to my friend and one-time colleague Dr. G. R. Goldsborough for some details respecting tides, and especially to my friend Mr. E. C. Bedwell, who very kindly provided me with details of the foreign distribution of about 200 species of coast Coleoptera.

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Linthorpe, Stepney Drive,
Scarborough.
August 4th, 1926.

BRACHYPTEROLUS (HETEROSTOMUS) VILLIGER REITT., A
CLAVICORN BEETLE NEW TO BRITAIN.

BY BENJ. S. WILLIAMS.

A single specimen of this species was captured by me on August 4th, 1922, whilst sweeping the mixed herbage growing on the cliff top near Bournemouth. A perusal of Reitter's table of the genus in the 'Fauna Germanica,' Käfer, vol. 3, p. 14, led me to conclude that my insect was referable to his *H. villiger*. My thanks are due to Mr. K. G. Blair, who, by his kindness in comparing it with a continental example, was able to confirm the identification. Mr. Blair remarks that the pubescence of my specimen is a little whiter than that of the example with which he compared it.

H. villiger is of nearly the same size as *H. pulicarius* L., but differs in its narrower and less convex form. Its outstanding characteristic is its hoary appearance due to the thick, long, whitish, depressed pubescence which almost obscures the punctuation and covers the head, thorax, scutellum (except the unpunctured

margins), elytra and pygidium. This dull hoariness is an obvious character by which the species can be recognised in the field. In *H. villiger* the basal angles of the thorax are more obtuse than those of *H. pulicarius*, but owing to the density of the pubescence in the former species the outlines of these angles are somewhat difficult to see.

[Perris records *Brachypterus cinereus* (=villiger Reitt.) from *Linaria supina* and *L. sparteae*, of which the former has been noted from Poole Harbour. —K.G.B.]

15 Kingcroft Road, Harpenden.

August 20th, 1926.

A FEW NOTES ON SOME WINDSOR BEETLES.

BY HORACE DONISTHORPE, F.Z.S., F.E.S., ETC.

For the last three years I have made an intensive study of the Coleoptera of Windsor Forest, as I am compiling a list of these insects for the Crown Estate Office, which is to be published in the forthcoming winter. These notes are in part supplementary to those published by Mr. Bedwell in the October number of this Magazine (*antea*, p. 240).

When I started seriously to investigate the Coleopterous fauna of Windsor, I made a list of all the earlier records (including those of Stephens), and have made special efforts to find the oldest recorded, and more interesting, species; not without success, as the following species met with will show: *Gnorimus variabilis* L., *Elater coccinatus* Rye, *E. nigerrimus* Lac., *Megapenthes tibialis* Lac., *Lymexylon navale* L., *Ludius ferrugineus* L., *Ischnomera sanguinicollis* F., *Scryptia fuscula* Müll., etc., etc.

In my list I have emphasized the fact that several species found at Windsor have been, or are, only found elsewhere in Britain in the New Forest, or Sherwood Forest, or in both. *Eucnemis capucina* Ahr. and *Lymexylon navale* L. may be mentioned in the first instance; * *Euplectus nubigena* Reitt., *Teredus nitidus* F. (*cylindricus* Ol.), and *Cryptocephalus querceti* Suffr. in the second; and *Synchita juglandis* F. in the third category. This last-named beetle (with the exception of a few odd captures) is practically confined to these three localities. Most of us have taken it in the New Forest; Sir Thomas Beare and I first took it at Sherwood, and I have found it in fair numbers at Windsor.

Lymexylon navale L. I was constantly hunting for this fine

* I have specimens of *Lymexylon navale* from Dunham Park, Cheshire, where it was taken in numbers in 1872 by J. Chappell and other collectors (Cf. Ent. Mo. Mag. vol. ix, p. 158, and Ent. Annual, 1872, p. 4.—G.C.C.)

beetle, and I found on several occasions its transverse borings exposed on bare patches on old oaks. It was not, however, until the present year that I found the living insect in several localities (including Mr. Bedwell's, which he had kindly indicated to me). Having determined to study its habits, I practically camped on the ground for three days on end, and made several other visits later on. The perfect insect lasts roughly for about a fortnight. A few females occur at intervals during the day, settling on old oak trees, but at about 5.30 p.m. (summer time) a marriage flight takes place, which lasts for some two hours. Males and females commenced to fly high up round the trees, occasionally settling on the upper branches, where I believe copulation takes place. I confined a female in a small muslin bag and fastened it aloft on a tree; numerous males on the wing made for this tree, swooping and settling on it, and flying off again. Some males and females seemed to arrive in a bee-line from a distance and to join in the joyous flight. Females, after flying round, would settle out of sight on a leafy bough, and males would be seen to fly round and alight on such branches. Every now and then a female would settle on a tree and commence to lay, thrusting her ovipositor, and indeed often half her body, into the cracks of the tree. After waiting some time, she would move to other cracks and repeat the same performance, eventually flying away. I caught and saw more males than females, but there were plenty of both sexes, the latter appearing to last longer than the former. The last time I saw the insect alive some thirty females were hovering over, and ovipositing in the cracks of a dead chestnut tree; these were not interfered with.

Teredus nitidus F. In 1924 and 1925 I kept coming across the remains of what I could only believe were, and which eventually proved to be those of this beetle in spiders' webs and cracks in the bark of oak trees. As Blatch, who rediscovered *Teredus* in Sherwood Forest in 1884,* records that his specimens were in every case associated with *Dryocoetes villosus*, I spent a great deal of time in investigating all such trees as were infested by this wood-borer. This in all probability deferred my capture of the insect; but eventually I ran it down, taking some eighteen specimens in Windsor Forest this year. On no occasion was *D. villosus* present in the trees where I found *Teredus*; but *Xestobium tessellatum*, *Anobium domesticum*, and *Ptilinus pectinicornis* did occur, and I found one specimen in the burrows of *Callidium variabile* in

* Cf. Ent. Mo. Mag., vol. xxi, pp. 36, 37.

a dead chestnut tree. Dr. Joy took a specimen of *Teredus* in quite a different part of the Forest, under a bit of bark on an oak, early this year. The first mention of *Teredus* as British is, I believe, in Stephens' Manual, 1839—'Under bark of trees : Sherwood Forest.' As far as I am aware it was not recorded again until 1884; and has not since been found until these Windsor captures.

Cryptocephalus querceti Suffr. I have taken this Sherwood species on several occasions in Windsor Forest, crawling on the trunks of oaks, also high up on the branches, and by tapping oak boughs in leaf.

Batrissodes adnexus Hampe. This beetle is apparently extremely rare in Britain, as well as abroad. In all the hundreds of nests of *Acanthomyops brunneus* that I have examined, I have only once come across it again (on June 30th this year), making the third British specimen since it was discovered by me in Britain in 1924. During this time I must have seen quite two hundred *B. delaportei* and thirty *B. venustus* in *A. brunneus* nests at Windsor. I can confirm Mr. Bedwell's specimen, having compared it with my original example.

19 Hazlewell Road, Putney, S.W.15.

October 11th, 1926.

THE EGG OF *PLOIARIOLA CULICIFORMIS* DE GEER.

(HETEROPTERA, REDUVIIDAE.)

BY W. E. CHINA.

On the 28th of August, 1926, Mr. H. Britten, of the Manchester Museum, captured a female *Ploiariola culiciformis* De Geer, which he found sitting on the top of a wooden fence at Wilmslow, Cheshire. By the 30th of August she had laid five eggs. These Mr. Britten kindly sent me so that I might try the difficult task of rearing the young predaceous larvae, should any hatch out. This species is found chiefly in the thatch of houses, summer-houses, ricks and sheds, and also in stacks of cut branches and faggots. I have, however, found it at the roots of low herbage and grass growing on the ledges of the cliffs in Guernsey, about twenty feet above high-water mark. Although there are no records for November or February, the adult insect evidently occurs all the year round. Nothing seems to be known of the life-cycle, with the exception of Burmeister's statement that the larva covers itself with dust. The fact that the egg is laid at the end of the summer is now established, and it will be very interesting to discover if the winter is spent in the egg stage or if the young larvae hatch

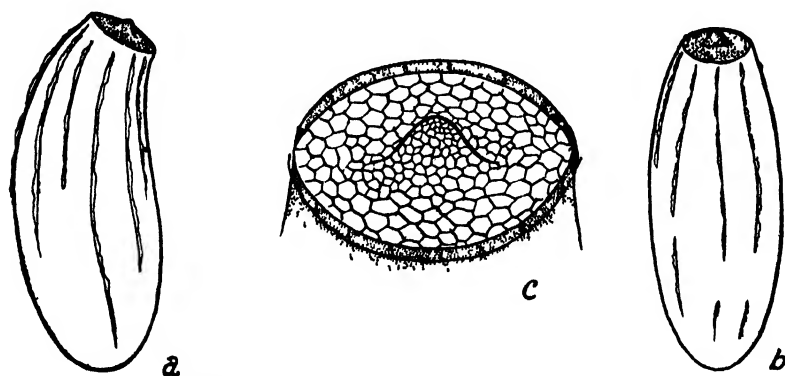
out in the autumn.* In the latter case one would expect them to find plenty of food amongst the numerous hibernating insects which crowd into their quarters during the winter months.

As the egg has so far remained undescribed, the following description is given, seventeen days after oviposition :—

Shining black, elongated, more or less cylindrical with the base hemispherically rounded, and the apex truncate. The greatest diameter is in the middle, and the truncate end is narrower than the rounded base. The apical quarter of the egg is distinctly bent to one side so that, seen from two view points, one side is convex and the other concave. The truncate micropylar end is sunk a little below the circular margin of the shell, and consists of a greyish-white finely reticulated cap with its centre conically elevated. The reticulations which comprise a network of elevated ridges on the surface of the micropylar cap are rather coarse around the circumference, but become finer towards the centre until, on the slopes of the conical process, they are almost obsolete. Around but just below the apical margin of the shell on a level with the circumference of the cap are 15 or 16 very minute micropylar processes similar to those found in Pentatomid eggs. On the lateral surfaces of the shell are several longitudinal narrow ridges of dried gum-like substance formed during oviposition.

Length 0.785 mm., widest diameter 0.315 mm., diameter of micropylar cap 0.157 mm.

From De Geer's description it would appear that the egg of the present species strongly resembles that of *Coranus subapterus*.



Egg of *Ploiarola culiciformis* De Geer.

a. Side view, showing curvature of apical quarter; b. egg seen at right-angles from position a; c. micropylar cap.

British Museum (Nat. History).

September 21st, 1926.

* Since this was written the eggs have hatched out, the young larvae being discovered on Sept. 30th. Although placed in an environment of hay and straw to resemble the habitat of the adults and supplied with small Psocids, and Diptera, the young larvae only survived for two days. From their helplessness amongst the hay and their desire to reach the sides of the box where they seemed to be at home, it would appear that they spend their early days walking on flat surfaces such as fences or walls. They are very sticky and this caused them considerable inconvenience as large pieces of hay, bracts and glumes, etc., kept clinging to them and preventing them from moving about.

'*British Ants*,' by H. St. J. Donisthorpe, F.Z.S.; a new edition.—We are requested to announce that a second edition of this well-known work, with the synonymy, etc. brought up to date, is now in the press, and will shortly be published.—EDS.

Otiorrhynchus porcatus Herbst : a new Irish locality.—On August 21st, 1926, I found an *Otiorrhynchus* which was new to me, so I sent it to Mr. Halbert who has identified it as *O. porcatus*. It occurred under pieces of bark at the foot of a chestnut tree in Clontarf, Co. Dublin, and I only obtained one example. This is apparently the second Irish locality, the first being 'Balrath, Co. Meath,' where some dozen examples were obtained by Dr. G. W. Nicholson in 1916 (E.M.M., lii, p. 203). Mr. Donisthorpe informs me that *O. porcatus* has occurred at Oxford in 1918, so the present capture would be the third for the British Isles.—EUGENE O'MAHONY, 'Minard,' Dublin Road, Sutton, Co. Dublin : October 8th, 1926.

New county records of aquatic Hemiptera.—During the last few years I have paid considerable attention to the *Cryptocerata*, especially to the genus *Corixa*, and a number of species have been captured in counties from which they are not recorded in Butler's 'Biology of the British Hemiptera.' The following notes are arranged under the counties :—BUCKS. : *Nepa cinerea* L., Gerrards Cross ; *Naucoris cimicoides* L., Gerrard's Cross ; *Notonecta furcata* Fab., Chorley Wood ; *Plea minutissima* Fuessl., Chorley Wood ; *Arctocorisa distincta* Fieb., Burnham Beeches ; *A. moesta* Fieb., Gerrards Cross ; *A. scotti* Fieb., Gerrards Cross. BERKS. : *Notonecta maculata* Fab., Hinksey ; *Arctocorisa hieroglyphica* Duf., near Swinford Bridge ; *A. fabricii* Fieb., Hinksey ; *Callicorixa praeusta* Fieb., Hinksey. OXON. : *Notonecta furcata* Fab., Wolvercote ; *N. maculata* Fab., Wolvercote ; *Corixa geoffroyi* Leach, common near Oxford ; *Arctocorisa lugubris* Fieb., Wolvercote ; *A. limitata* Fieb., Handborough ; *A. fossarum* Leach, Port Meadow ; *A. fabricii* Fieb., common round Oxford : *Callicorixa praeusta* Fieb., Wolvercote. MIDDLESEX. : *Notonecta viridis* Delcourt (*halophila* Edw.), Hampstead Heath ; *Corixa panzeri* Fieb., Hendon ; *Arctocorisa hieroglyphica* Duf., Hampstead Heath ; *A. limitata* Fieb., Stanmore ; *A. moesta* Fieb., Stanmore ; *A. germari* Fieb., Hampstead Heath ; *Callicorixa concinna* Fieb., Hampstead Heath ; *Cymatia coleoptrata* Fab., Hampstead Heath. SURREY. : *Notonecta viridis* Delcourt (*halophila* Edw.), Oxshott ; *Arctocorisa semistriata* Fieb., Oxshott. ESSEX. : *Notonecta viridis* Delcourt (*halophila* Edw.), Pitsea. LANCASHIRE. : *Arctocorisa selecta* Fieb., Hale Moat, near Liverpool. CORNWALL. : *Corixa selecta* Fieb., St. Mary's, Isles of Scilly. GLAMORGAN. : *Arctocorisa scotti* Fieb., Pendoylan ; *Cymatia coleoptrata* Fab., Cardiff, Newport Road, brickponds.—O. W. RICHARDS, Oxford : October 11th, 1926.

Capture in England of female and worker of Bombus cullumanus K. (Hym.).—Although so many males of this bee have been captured, no females have yet been recorded, for Smith's specimens in the British Museum are only *B. pratorum* L. This year a determined search was made for the species on the Berkshire Downs where Burtt found so many males in 1916 and 1921 (E.M.M. April 1923). Here, near Cholsey, on May 15th, a female was captured which is certainly this species. The specimen is extremely like *B. lapidarius* L. except in the following particulars : the two tubercles on the labrum are more convex and more shining, not being alutaceous as in *lapidarius* ; the furrow

between the tubercles is wider and less clearly defined; the cheeks are distinctly shorter and have more punctures; the clypeus is more deeply impressed on each side at the apex with the depression more punctured; the wings are darker, with a conspicuous apical suffusion; the hind metatarsus on the outside has only a few hairs and so appears quite shining (in *lapidarius* the same part has dense yellowish hairs); the fifth tergite has a slight central impressed line (in *lapidarius* the centre of the tergite is distinctly convex); the sting also has important structural differences, which I hope to describe in another paper in the near future.

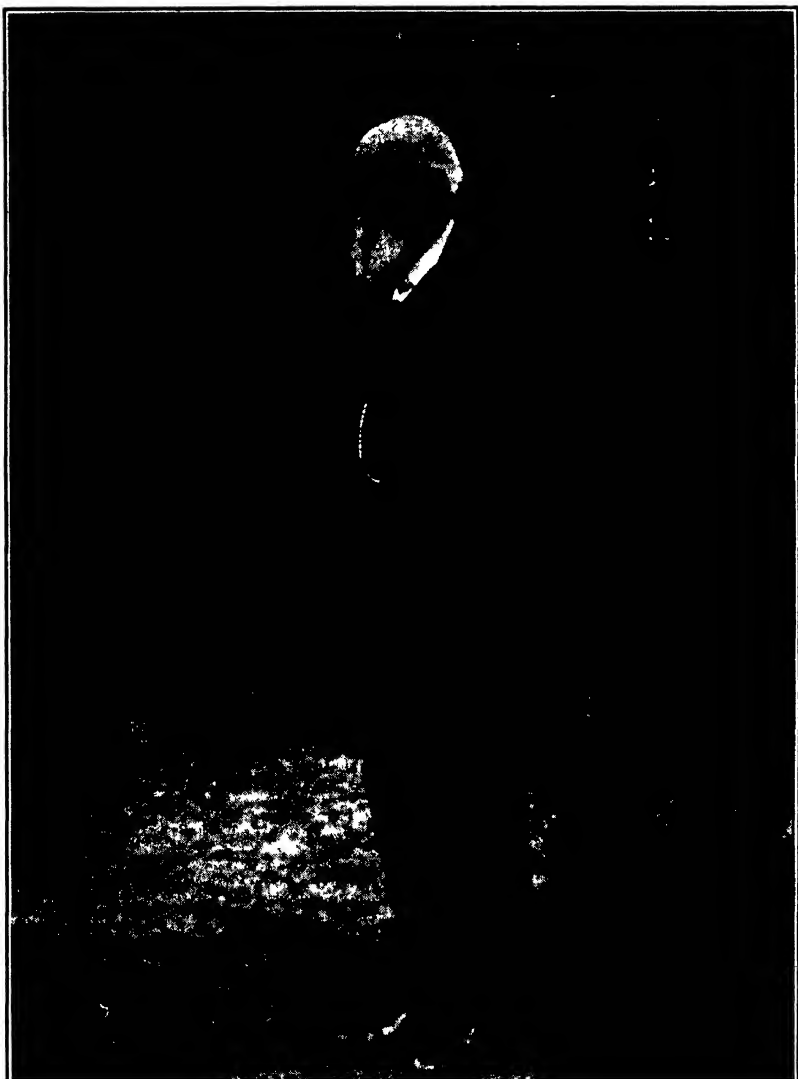
The capture of this specimen made it possible to identify a worker taken near Tring, Bucks., in September 1924. This agrees with the female except that the wings are more evenly suffused, and the impressed line on the last tergite and the difference in the sting are not so marked. The labrum also is not so distinctive, for in the worker of *lapidarius* the tubercles are only alutaceous at their front margin. This worker agrees in all particulars with a pair in the British Museum from Schleswig (named by Friese). No doubt the examination of females resembling *lapidarius* in districts where the male of *cullumanus* has been taken will lead to the capture of more females.

My thanks are due to Dr. Waterston for his help in my examination of the material in the British Museum.—O W RICHARDS, 70 Belsize Park Gardens, Hampstead: September 22nd, 1926.

Note on Mesochorus facialis Bridgm. (Ichneumonidae).—In recording the breeding of this hyperparasite from a larva of *Nola cucullatella* through *Meteorus fragilis* Wesm. (E.M.M., LXII, p. 239), Dr. Waterston remarks 'a species of some rarity, or, at least, one whose distribution and host attachment are very imperfectly known.' It may therefore be of interest to record that I have found the insect to be a common hyperparasite of the larvae of the Cinnabar Moth (*Hypocrita jacobaeae*) through *Apanteles popularis* Hal., both in the New Forest and on the North Norfolk Coast. I have also reared it from *Agrotis strigula* through *Meteorus pulchricornis* Wesm., and from *Nola cucullatella* through *Apanteles viminitorum* Wesm., while Dr. E. A. Cockayne has kindly given me an example which he reared from a larva *N. cucullatella* through *Meteorus fragilis* at Longton, Staffs., in July 1920.—G. T. LYLL, Briarfield, Shibden, Halifax October 7th, 1926.

Obituary.

The Rev. F. D. Morice, M.A., F.Z.S.—The death of the Rev. Francis David Morice, a regular and valued contributor to this Magazine for many years, took place at his residence, 'Brunswick,' Woking, on the 21st September, last. He was born on the 23rd June, 1849, in Hamilton Terrace, St. John's Wood. On the paternal side he was of Scottish extraction, his forbears hailing from the N.E. counties of Scotland, while his mother came from Dorset. His early education was gained at various private schools, the last of which was at Streatham, and at the age of eleven he went to Uppingham, leaving there for Winchester at fifteen. It was probably this alteration in schools which led to a change in his tastes, for at Uppingham he had a distinct leaning towards mathematics and was considered to be above the average in ability in this



Admiral Walker, photo.]

Yrs sincerely
F. Maurice

subject, but at Winchester he lost his liking for this study and at no period in after life did he recover it. At seventeen (in 1866) he entered New College, Oxford, where he attained high distinction as a classical scholar, gaining the Chancellor's Latin Essay Prize and becoming the first Craven Scholar. He used to attribute his success at this period to the careful coaching he received at the hands of him who afterwards became the first Lord Loreburn. In 1871 he was elected a Fellow of Queen's College, and two years later he was ordained. The following year he accepted Dr. Jex-Blake's offer of a post at Rugby and there he remained until 1894 when a breakdown in health forced him to resign, but during those years, in spite of scanty leisure, he found time to make valuable contributions to classical literature and several of his works still maintain a steady sale.

It was as a Hymenopterist that we of the present day knew him best, and the circumstances leading to his becoming so were fortuitous and yet characteristic of Mr. Morice, for there was nothing in his life up to the age of thirty-six that would have led one to believe that he had any interest in natural history. In 1885 he was made President of the Rugby School Natural History Society, and in order to justify his election he thought he ought to know something about the things which were interesting his boys. A desultory study of the Lepidoptera was his first essay, but finding that some of the other orders promised a greater field of fruitfulness he turned his attention to the Hymenoptera and ultimately got in touch with Edward Saunders who became his friend and guide. The meeting of the two men in their maturity was not however their first, for though both had forgotten it at the time they had met in their boyhood in the house of Sir Sidney Saunders. His first contribution to this Magazine was made in 1889 and few years passed without something appearing from his pen; the Chrysidae and the bees and wasps attracted his attention first, but acting upon Saunders' suggestion he began work seriously on the Tenthredinidae, a family to which he was destined to devote the remainder of his life. His 'Help Notes,' begun in 1903, appeared at irregular intervals until 1916 and proved of great value to students; at the time of his death he was engaged upon a revision of the British species of this family, and his handbook would probably have been in the press now had it not been that Mr. Morice became involved in certain nomenclatural difficulties which held up the work. He served the Entomological Society well and his attainments were recognised by his election as President for 1911 and 1912. In 1907 he represented the Society at the bicentenary of the birth of Linne, at Upsala, in 1912 the 250th anniversary of the foundation of the Royal Society, and also the second International Congress at Oxford, while we remember his venerable figure at the third Congress at Zurich last year.

An indefatigable traveller all his days, Mr. Morice had wandered much throughout Europe, Palestine, Egypt and N. Africa. In his entomological period he was always accompanied on these trips by one or more friends of like tastes, and the Hymenoptera he collected were distributed subsequently amongst various specialists with whom he maintained a close friendship. The last of such journeys was to Tozeur and Nefta, in S. Tunisia, in 1913, when Mr. Champion, Theodor Steck and Dr. Schulthess were his companions. His rich collections of Palaearctic Hymenoptera go to the Hope Museum, Oxford. A man of charming disposition with an old-world courtesy, a good raconteur, a cultured taste in art, and an exceedingly acute ear in music allied with considerable skill in improvisation, Mr. Morice made a delightful companion and had a host of friends.—F. LAING.

George Lewis, F.L.S., F.E.S.—With very great regret we have to announce the death, at Folkestone, on Sept. 5th, of George Lewis, at the age of eighty-seven. Most of his long life was devoted to the systematic study of the Coleoptera, and for many years he has been recognised as the chief authority on the Histeridae of the world. Born on August 5th, 1839, he was the second son of the Rev. R. G. Lewis, Vicar of St. John's, Blackheath. A keen collector of British beetles from his youth, he turned his attention to those of China when, at the age of twenty-three, he was sent there as the representative of a firm engaged in the tea trade. A great part of his Chinese collection seems to have been lost through transport difficulties, but a number of previously unknown species were described, notably of Carabidae, by H. W. Bates. About 1867 Lewis went to Japan, a country whose insect fauna was at that date very little known, and the result of five years' efforts was the amassing of a remarkable collection of Japanese Coleoptera of which a large proportion were new to science. The classification and naming of these by himself and the various specialists to whom he submitted them occupied several years after his return to England in 1872. In 1880, with his wife, formerly Miss Julia Hunter, of Wimbledon, he again visited Japan in order to continue his work by the investigation of parts of the country previously unexplored. His earlier collection had been confined to the southern half, but he was now able, for the greater part of two years, to travel almost from end to end of the archipelago and, with the help of a very efficient native collector whom he trained for the work, to send home a magnificent collection. Upon the return journey, six months were spent in Ceylon, where also he collected assiduously, finding, according to his own estimate, about 1,200 species of beetles.* Reaching England in 1882, he devoted himself, with the assistance of numerous experts, British and foreign, to the investigation and description of his collections. These, when acquired by the British Museum in 1910, contained the types of so large a proportion of the known species of Japanese Coleoptera that they will probably never be equalled in importance by any collections which may be brought together in the same country.

When studying the Histeridae of Japan, Lewis found it essential to acquire an adequate knowledge of those of the rest of the world, and for this purpose he endeavoured to form a general collection of these insects. Finding that the species of other regions were no better known than those of Japan he was led to extend his study of the Family until ultimately most of his time was devoted to this comparatively small group. His first paper on the Histeridae of Japan was published in 1884, and for the next thirty years it was followed by others in regular succession upon the same family. When, eleven years ago, he wrote his last paper, he had described no less than 60 genera and more than 750 species of Histeridae. The splendid collection of these beetles which resulted from so many years devoted to their study was bequeathed to the British Museum.

He was probably the last surviving contributor to the first volume of this Magazine, on p. 262 of which appears a brief note by him dated Nagasaki, July 1864.

A man of fine physique and of a peculiarly refined, gentle and attractive character, he was also of an extremely retiring disposition and, in spite of the importance of his scientific work, was known only to a very small circle.

—G.J.A.

* An Itinerary of the Ceylon journey was published by H. W. Bates in *Trans. Ent. Soc. Lond.* 1882 and that of the second Japanese expedition, with a map, in *Trans. Ent. Soc. Lond.* 1883.

ENTOMOLOGICAL NOTES ON A TOUR OF THE KUMAON-TIBET
BORDER IN 1924.

BY H. G. CHAMPION, M.A., F.E.S.

WITH DESCRIPTIONS OF THREE NEW RHOPALOCERA

BY N. D. RILEY, F.E.S.

PLATES II, III.

In the summer months of 1924 an opportunity was found for visiting the more inaccessible northern corner of Kumaon and the adjoining parts of Tibet near the head of the Sutlej River. The tour took ten weeks, of which three were spent in getting to and from the real starting point, the village of Munsiri, which is situated at 6,000 ft. over the Gori River. The Gori is one of the chief branches of the Kali, which, as the Sarda, eventually joins the Ganges on the borders of Bihar. Munsiri is about a hundred miles by bridle path from the foot of the hills. From Munsiri one follows thirty miles up the precipitous gorge of the river, through the granitic axis of the Himalaya proper, to Milam, at 11,400 ft. Milam is a well-built stone village close to the snout of the chief glacier from which the river takes its rise, and in its neighbourhood are several smaller villages such as Burfu (10,760 ft.), Tola (10,760 ft.), etc. (See the sketch map illustrating Mr. Andrewes's paper published in the March, 1926, number of this magazine, p. 80.) There is extensive upland grazing all round, and no crops are raised except a little barley and buckwheat near the villages.

Continuing northward past Shillung (12,000 ft.) and Dung (13,800 ft.) cattle stations, one crosses the Uta Pass at 17,590 ft. into the head waters of the Dhauliganga branch of the Ganges, with undulating grazing grounds on which are situated the camping grounds of Topidhunga (14,830 ft.) and Matoli (14,200 ft.). The northward outlet from this Girthi Valley is the Kyungar Pass (17,000 ft.) into the Kiogadh Valley, which is more extensive and less steep and includes the encampments of Shelshel (15,500 ft.), Chojan (15,750 ft.), Laptel (14,750 ft.), Sangcha (14,300 ft.) and Kiogadh (15,500 ft.). The river bed here is at about 13,500 ft. Some time was spent in this interesting section, including one or two expeditions across the easy Shelshel Pass (16,390 ft.) into Tibet (the Shaga Valley), before camp was moved for ten days through the Balch Pass (17,590 ft.) into the gravel terraces above the Sutlej. One can camp anywhere in this part of Tibet, thanks to the flatness of the several old lake levels, and the names given for the spots where the tents were pitched were Janku, Pangta, Chaldu and Chirchun, all over 15,000 ft. Pangta is on the Supi

River, not far from its junction with the Sutlej, some eighty miles from the large Rakastal and Manasarowar Lakes (14,900 ft.). From Chirchun (16,500 ft.) the strenuous day's march was made over the Kungribingri (18,300 ft.), Jandī (18,000 ft.) and Uta (17,590 ft.) Passes back into the Gori basin and to Milam. The return to the outer hills was made under difficulties, as the monsoon was in full force and a particularly wet spell was encountered.

A few words on the vegetation are required. Directly the main Himalayan axis is traversed (in the Gori Gorge) there is a fundamental change in the flora mainly consequent on the greatly reduced rainfall (less than 10 in., mostly as snow), particularly that in the warmer months. Tree forest just straggles as far as Milam with some patches of birch and *Rhododendron* and a little *Abies*, and shrubs such as *Cotoneaster*, *Lonicera*, *Viburnum* and *Berberis* become predominant. The genera and some species at Milam are still those of the higher elevations of the adjoining hills exposed to the monsoon, but a new element is added which becomes more and more conspicuous further in to the exclusion of the original forms; *Caragana pygmaea* DC. is a good example of this. Junipers are common at Milam, but were not seen in Tibet. Further behind the range, the poorer the flora becomes, and the Tibet area seen was occupied by open scrub about one foot high, composed almost entirely of three species, *Eurotia ceratoides* C. A. Mey., *Potentilla fruticosa* L., and *Caragana pygmaea* DC., with dwarf crucifers, etc., between the patches. Only along the sheltered stream beds was there a richer flora with *Salix*, *Myricaria*, etc. The undulating grazing grounds at the head of the Ganges and Gori Rivers are rather richer, but vegetation is very rarely luxuriant, or the formation closed over any considerable area.

It is proposed here to reproduce some of the notes made on the Coleoptera and Lepidoptera Rhopalocera met with, the other matters of interest having been described elsewhere. Only the region immediately behind the Himalayan axis is dealt with unless otherwise stated, and all altitudes are thus at least 10,000 ft. and mostly over 13,000 ft. As far as is known, insects have not been systematically collected in any part of the area visited, though botanists and others have brought back odd specimens, particularly of the butterflies. The latter have been kindly determined for me by Mr. N. D. Riley and Commander J. J. Walker. The Coleoptera mentioned have been named by H. E. Andrewes, A. d'Orchymont, the late A. Knisch, G. C. Champion, K. G. Blair and other specialists.

The Heterocera and other insects taken have not yet been studied, but it may be noted that various species of the Hemipterous-genus *Salda* were found under stones, not necessarily in wet places, at 15,000 ft., mostly in Tibet. Amongst the Hymenoptera were many Ichneumonidae, indicating a hidden abundance of Lepidopterous and other larvae, familiar-looking *Bombus* spp., up to 16,000 ft., some at light, some at flowers of *Thermopsis inflata* Camb., *Heracleum*, etc. In the Diptera, a pair of an Asilid, the ♀ carrying its prey, was noted at Laptel, alt. 15,000 ft., and numerous species of other groups were found floating upon the tarns, etc. Orthoptera were rare and represented by a large grasshopper with blue underwings, *Bryodema luctuosa* Stoll, on the Tibet plains, and an apterous Locustid, *Hypphinomos fasciata* Uvarov, on the Shelshel Pass, at 16,000 ft. The marmots were found to be infested with a large flea, *Ceratophyllus silantiewi* Wagn. (1898), but the hares examined seemed to be free from this kind of parasite.

COLEOPTERA.

Special attention was given to this Order, and thorough search made of all places likely to be productive, with the exception of the marmots' nests (which much regretted omission was due to the loss of the spade taken up expressly for this purpose; this happened by its being carried away when the transport animals—'jibus' = yak × cow—were fording a difficult glacial stream).

Species are few in number compared with the rich fauna of the adjoining parts of the Himalaya reached by the monsoon, and mostly represented by very few examples, with the exception of one or two apterous Rhynchophora and Tenebrionidae, living under stones with literally hundreds of earwigs, and a few flower-frequenting forms. Several Carabidae* of Palaearctic facies were also by no means scarce, but could rarely be called abundant.

Perhaps the best means of conveying a general idea of what may be met with is to give a few notes on the species frequenting different habitats. By far the greatest number of insects are to be found under stones, especially under those lying partly on and partly embedded in the turf or soil, just as in Alpine areas all over the world. They are mostly apterous, and many are hard and perhaps uninviting to insectivorous birds; they are black or brown in colour and usually nocturnal in their movements; possibly they collect under the stones for warmth as well as protection from view. The most common species are *Harpalus melaneus* Bates, *Amara (Bradytus) compacta* Bates, *A. darjelingensis* Putz., *A. (Niphobles) splendens* Andr., sp. n., and *Calathus atrema* Andr., sp. n. (Carabidae); *Bioramix* sp. ? and *Ascelosodis everestina* Blair (Tenebrionidae); *Leptomias longulus* Fst. and other undetermined Curculionidae. Specially interesting was an apterous Chrysomelid forming a new genus allied to *Xenomela*, *Apaksha himalayensis* Maulik,† which was quite common in both the Gori and Ganges drainage areas (mostly in copula, or the ♀♀ gravid, in July).

With the beetles already mentioned were found in smaller numbers and often over a restricted area, *Carabus waghae* Fairm. (Girithi Valley only), *Hypsinephus ellipticus* Bates and *Amara (Cumeres) thalia* Andr., sp. n. (last two species on and across the Tibet border), *Anchomenus lissopterus* Chaud. (common generally in Kumaon above about 6,000 ft.), *A. 4-punctatus* DeG. (a British insect), *Cymindis alticola* Andr., sp. n. (only on and near the border and often under very old dry cow-dung), *Tachyporus* spp., *Lacon* spp., *Cryptohypnus* spp., *Corymbites* spp., *Adimonia indica* Bates, *Blaps socia* Seidl. (?). *Formicomus*

* See H. E. Andrewes, E.M.M. 1926, pp. 65–80.

† 'Fauna Brit. India,' Chrysomelidae, p. 96, fig. 34 (1926).

sp., and various undetermined weevils. In connection with the first-named of these, it may be noted that *Carabus boysi* Tatum, the common Kumaon species of its genus, was taken singly at Samgong, at over 13,000 ft.

Among the shingle along the streams a different set of species is found, virtually all Carabidae and Staphylinidae. Numerous species of *Bembidium* extend some way up the Gori Gorge (e.g., *B. regale* Andr., which is a very fine large blue form, *B. radians* Andr., *B. notatum* Andr., etc.) apparently without getting right through, but *B. cimmerium* v. *orinum* Andr. and *B. bracculatum* Bates range to Milam, the last-mentioned being also found at the head of the Ganges streams at Laptel. *B. pluto* Andr., which is also recorded from Ladak far to the west, was found freely at Sangcha and Shelshe, whilst *B. himalayanum* Andr., with similar distribution, was only found along the Supi River in Tibet, being common enough there. *Nebria pallidipes* Breit. was to be found commonly on the Milam flat, but not elsewhere, and *N. limbigera* Solsky turned up at Shelshe, being very like *N. xanthacra* Chaud., which is common all over Kumaon at lower elevations (1,000–5,000 ft.). *Anchomenus caesitius* Andr. occurs along the Gori up to Burfu. *Opisthius indicus* Chaud., somewhat resembling an *Elaphrus*,* was an interesting find near the upper end of the Gori Gorge, but only a single specimen was seen: this was not sent to Mr. Andrewes, and is not included in the species enumerated by him (E.M.M. 1926, p. 66).

Special search was made among the stones in the small brooks and torrents for *Dianous*, *Geodromicus*, and *Hygrogeus*, genera so strikingly developed in the Himalaya. *Dianous* evidently does not extend so high up, but one species of *Geodromicus* and two of *Hygrogeus* were taken. The most abundant and widespread is probably a high-level form of *H. cyanipennis* Cam., and has been described as var. *atrocaeruleus* Champ.; it was found at Burfu and Laptel. Round this last-mentioned place *H. kumaonensis* Champ. was found freely, and not far away, at Shelshe, a single specimen was taken of a much smaller species since described as *G. brevitorsis* Champ. A single *Ancyrophorus* (*A. monticola* Cam.) was also obtained.

Flower-frequenting insects were looked for whenever an opportunity offered. A fine thistle (*Cousinia thomsoni* Clarke) yielded near Milam numbers of *Cistelomorpha foveolata* Pic. This species occurs in two forms, with the elytra either red or black, and it is interesting to note that at Milam, which is well into the dry zone, only about 2% of the melanic form was seen, whereas at Laspa, ten miles southwards, where the typical monsoon zone vegetation comes in, over 50% were black. A large reddish *Meligethes* was also common on this thistle, as well as a bright green Galerucid, *Apophyllia* sp. At Laspa, a Staphylinid, *Amphichroum anthobioides* Champ., was abundant on umbels. Flowers likely to attract Coleoptera are few beyond the passes, the most promising being *Potentilla fruticosa* L. and umbellifers (*Heracleum* and *Petroselinum*). The former yielded plenty of a new Malachiid—*Charopus tibetanus* Champ.—on the Tibet side, and the latter a Dasytid—*Procerallus altivolans* Champ.—on both sides of the frontier, and two others, *Dasytes tibetensis* Champ. and *D. simplicitorsis* Champ. Almost the only other species taken in this way was *Charopus laptelensis* Champ., both sexes of which were found very freely on flowers of *Polygonum tortuosum* Don., growing on shaly screes. A single *Antherophagus*, also new (*A. nigricollis* Champ.), probably living with a species of *Bombus*, was taken casually at Laptel.

The entrances of the burrows of the marmots yielded on examination plenty

* Probably the '*Elaphrus*' of the Donkia Pass mentioned by Hooker.

of a new species of *Atheta* (unknown to Bernhauer and Cameron) not unlike *A. currax* Kr., but nothing else.

There are several quite small lakes in the area visited. In them the only flowering plants were the British *Potamogeton pectinatus* L. and *Ranunculus aquatilis* L., and the water-net yielded abundance of two species of *Helophorus* (*H. frater* and *H. montanus* d'Orchym., n. spp.), an *Agabus* and a *Hydroporus*. These were not seen on the Tibet side, where only a single specimen of a species of *Laccobius*, *L. championi* Knisch, sp. n. was netted. A second *Agabus* was found in the Kiogadh at 13,000 ft. and in the Gori Gorge at 7,000 ft. All sorts of flying insects can be found floating on the water, all having been blown in, especially Diptera and Hymenoptera.

Sweeping herbage was totally unproductive except for the *Helophori* mentioned, and the species found in flowers. It was hoped that a special plant like *Eurotia* might give something interesting, but this did not prove to be the case.

A few *Aphodii* and coprophagous Staphylinidae (*Coprophilus burphuensis* Champ., sp. n., etc.) occur, but only rarely beyond Milam, where swarms of the former follow the sheep like flies. Besides this, odd specimens of two other *Aphodius* came to light, and two species of *Geotrupes* were picked up. An *Atheta*, a species of *Aleochara* (*nitida* Grav.) and a *Hister* were also found in dung, and, as already mentioned, *Cymindis alticola* (and other *Carabidae* to a less extent) often shelters under dry patches.

Not many Coleoptera were found to come to light, with the exception of a *Serica*, which swarmed in the Milam Valley, and the Telephorid, *Stenothemus volaticus* Champ., in almost equal numbers. A single *Zonabris macilentia* Mars. came into the tent at Burfu.

Odd specimens of insects picked up on the ground included a big *Hemidorcus*, two species of *Meloë* (*M. transversicollis* Fairm. ?, at Chojan and Kyungar, 15,000-15,500 ft., and *M. n. sp.*, at Milam, 11,500 ft.), and a brightly coloured Malachiid, *Attalus nigropustulatus* Champ., *Cantharis* (*Telephorus*) *biocellata* Fairm., at Milam and Burfu, etc.

RHOPALOCERA.

The butterflies collected were relatively few in number of species, but not without interest, especially when compared with the lists published of those found on the recent Mt. Everest expeditions. All the genera but one are European, and many of the species are very similar and closely allied to western forms. Most conspicuous is *Parnassius*, which is sometimes so abundant that two or more per square yard can be seen in sheltered hollows. Five species were met with, of which the commonest was *P. jacquemonti* Boisd. (though this was not seen at Milam). *P. hardwickei* Gray was found over the whole area, except in Tibet, and was not rare, with an occasional *P. epaphus* Oberth., whilst a few *P. simo simo* Gray were taken across or close to the Tibet border. A single *P. delphiuss* Eversm., sub-sp. n., *kumaonensis*, at Shillung, 12,000 ft., completes the list. *Papilio machaon asiatica* Mén. was seen at Milam and again in Tibet, where it probably feeds on a *Heracleum* common there.

Mesapia peloria Hew., a remarkably small Pierid related to *Aporia*, was found abundantly in one or two places in the Girithi Valley, but was extremely local; it is especially interesting, as being quite unrepresentative on the Everest lists; it was usually found frequenting the strips of dense growth of *Geranium pratense* L. which are characteristic of the inner valleys. *Baltia butleri* Moore was an interesting find on the passes, very local and not easy to net, what with the wind and the difficulty of rapid movement at these elevations.

The genus *Colias* was well represented. *C. fieldi* Mén. is the common Kumaon species, a typical *edusa*-like form, and was found up to 13,000 ft.: it was the only species seen in the vicinity of Milam. In the Kiogadh Valley *C. ladakensis* Felder was quite abundant; it is a fine pale clear yellow insect with the ♀ rather richer in tint than the ♂. Some of the latter are var. *flava* nov., with which were perhaps 5% of the deep orange *C. eogene* Felder, but no *C. fieldi*. *C. ladakensis* was found in Tibet, but neither of the other two were netted there. The only other Pierine taken was *Pieris* (*Synchlœ*) *callidice* Esper, form *kalora* Moore, occurring at Shillung and again close to the Uta Pass at 15,000 ft.

The Lycaenidae were represented by several species. *Heodes pavana* Kollar is the common species of its genus in Kumaon; on this occasion it was found along the Gori River up to 8,000 ft., but did not quite penetrate the gorge. At Milam *H. phlaeas* L. has taken its place, but this species too was not seen beyond the passes. The ubiquitous *Lampides boeticus* L. put in an appearance at Laptel (14,000 ft.), though only a single worn specimen was netted. *Lycaena galathea* Blanch. and *Polyommatus dux*, sp. n., are rather striking insects, owing to the greenish metallic appearance of their undersides: they were met with on sheltered banks near Milam and Burfu. *L. pheretes* Hübn., a small and inconspicuous species, was locally common in the Girthi Valley, and at Shibchilan, Chojan, and Lal Pahar in Tibet. A single specimen of the *Polyommatus icarus*-group, *P. ariana* Moore, occurred at Laptel. The Everest expeditions brought back eight species in all from high altitudes: *Heodes phlaeas*, *Lycaena pheretes* and four *Lycaena* species, and two *Polyommatus*. The handsome metallic blue-green *Heliophorus androcles coruscans* Moore and its close ally, the deep blue *H. oda* Hew., both found not rarely in the Gori Gorge at 12,000 ft., but not higher, are worth mention. A third member of the genus, *H. senna* Koll., a much commoner species, was also met with at a much lower elevation, 6,000 ft.

Zephyrus syla Koll., one ♀ and a somewhat aberrant ♂, and *Z. mandara* Tsch., four ♂♂, occurred in the E. Ramganga Valley, or on the Girgoo Pass, between 5,000–8,000 ft., and *Chaetoprocta odata* Hew., one ♀, at Gurgaon, 8,500 ft.

Among the Nymphalidae, Erebiids were expected but hardly seen. *Callerebia shallada* Lang occurred in the Gori Gorge but not higher, and the only other species noticed was well into Tibet; this latter insect was not secured, but was probably an *Oeneis*. *Aulocera werang* Lang was also found as far up as Milam. It may be noted that one *Oeneis*, three *Paroeneis* and two *Argestina* were obtained on the Mt. Everest expeditions. Of the Vanessids, two species of the *V. urticae* L.-group were taken: *V. cashmirensis* Koll., a very dark form, which is the usual one throughout Kumaon, and extends as far as Milam, whilst north of the passes it is replaced by *V. urticae rizana* Moore, which is much more like European *V. urticae*. One is tempted to correlate this change with the replacement beyond Milam of *Urtica parviflora* Roxb. by *U. hyperborea* Jacquem. *Pyrameis cardui* L. occurs here as elsewhere—several worn specimens were seen up to 15,000 ft. A *Polygonia* was seen near Burfu but not secured; it may well have been *P. egea interposita* Staud. Argynnid were represented by *Argynnis jainadeva* Moore, a showy form similar to *A. adippe* L., which was only seen in one locality in Tibet, visiting the flowers of *Nepeta supina* Stev., whilst *A. eugenia rhea* Gr.-Gr.* was fairly general there (at Shaga) among the *Caragana*,

* The British Museum has examples of the nearly allied *A. mackinnoni* de Nicev., taken by the botanist, J. F. Duthie, at the Gori Pass in this region.

etc., and was also taken rarely in the Kiogadh basin. The local form of *A. lathonia* L. (*issaea* Doubleday) extends very high on the south side of the range, at least up to 14,000 ft. Finally, *Melitaea arcesia sindura* Moore was locally common on the north of the Passes on both sides of the Tibet border; it is very difficult to see when it settles low down among the vegetation, as it does directly sunshine fails, owing to the assimilation of the under-side colouring with the surroundings.

No Hesperiidæ are recorded from the Mt. Everest expedition and none were brought back from this tour, except an undetermined species of *Augiades*, watched but not netted, at 14,000 ft., and a ♀ of *Hesperia galba* F., from the E. Ramganga Valley, 5,000 ft.

DESCRIPTIONS OF THE NEW RHOPALOCERA OBTAINED.

BY N. D. RILEY, F.E.S.

Parnassius delphiuss kumaonensis ssp. nov. (Plate II, fig. 3).

♂. Belongs to the *P. delphiuss stoliczkanus* group of sub-species. Length of fore-wing only 25 mm. Post-discal dark band not extending below middle of area 4; marginal and sub-marginal bands strongly developed, posteriorly united (areas 1 b and 2). Hind-wing with a small red ocellus in area 7 only; the usual red ocellus in 5 represented by a small black spot about 1 mm. in diameter; four sub-marginal black spots, those in 2, 4 and 5 sub-equal, almost devoid of blue scaling, that in area 3 rather larger and heavily scaled with blue. Under-side as above, but on the hind-wing the black ocellar spot in area 5 is red-centred.

Hab. N. Kumaon, Shillung, 12,500 ft., 7. vii. 1924 (*H. G. Champion*). ♂ Holotype in B.M.

A comparison of the figure with Felder's figure of his *stoliczkanus* (*Reise Novara*, II (2), Pl. 69, fig. 2) should be of assistance in the recognition of this new subspecies—the most easterly so far recorded from the Himalayan Range.

Colias ladakensis ♂-f. *flava* nov. (Plate II, fig. 4).

The colour features which distinguish this form (fig. 4) from normal *ladakensis* Feld. (fig. 5) are adequately shown on Plate II. The upper-side ground colour is almost the same as in *C. nina*, for which species the form was temporarily mistaken. Marginally, especially on the hind-wing, the ground colour approaches fairly closely the clear greenish-yellow of *ladakensis*. The style of these marginal markings, however, and more especially the under-side, are exactly as in *ladakensis*, although the latter is rather less greenish.

A cursory examination (without dissection) of the visible portions of the ♂ genitalia of *ladakensis* and *nina* reveals no difference between the two. They both resemble f. *flava*. It is a moot point whether *flava* is a race of *ladakensis* or of *nina*, or whether *ladakensis* and *nina* are specifically distinct. Their ranges do not overlap; *flava* occurs, together with typical *ladakensis*, about midway between the centres of their respective areas. The type of the form *flava* was captured at Laptel, N. Kumaon.

It is interesting to find that Major Charlton, collecting in almost the same region as Mr. H. G. Champion, but about the middle of last century, also obtained a single ♂ of the *flava* form, together with three ♂♂ of typical *ladakensis*. The type has been presented to the British Museum.

Polyommatus dux sp. nov. (Plate III, figs. 4 ♂, 5 ♀).

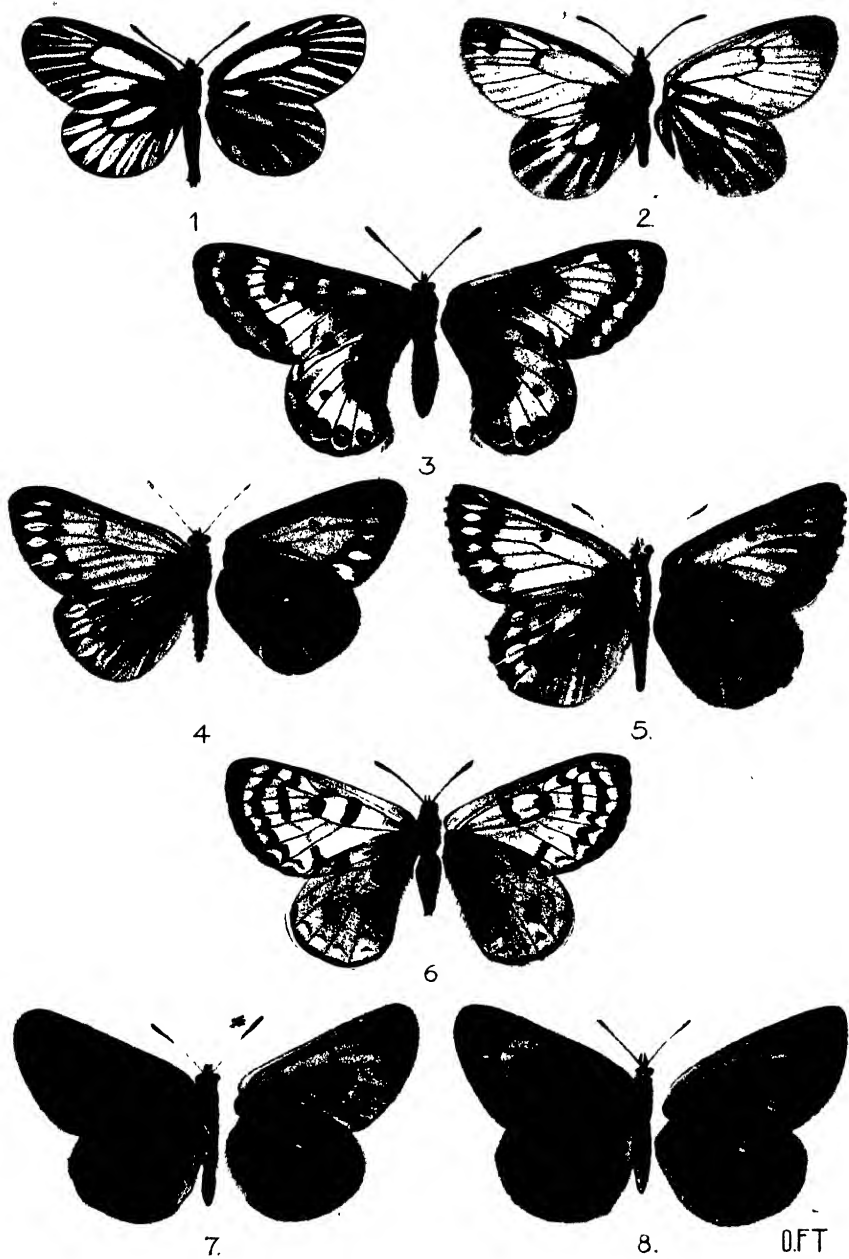
♂. Upperside, both wings intermediate in colour between *P. icarus* L. and *P. ariana* Moore; no spot at cell-end; margins with a thread-like black line; basal halves of cilia grey, distal halves white. Fore-wing sub-marginally somewhat greyish, especially towards tornus; veins finely silvery-blue, but dark against margins. Hind-wing narrowly blackish about apex. Under-side, fore-wing French grey, the veins (in distal half of wing), and also a fine marginal line, darker grey; a large irregular spot at cell-end, and a discal series of 6 (areas 1 b-6) moderately large spots all white (or very pale grey), diffuse, and finely dark pupilled; a double series of very faint diffuse pale sub-marginal spots most readily seen towards tornus. Hind-wing (except margin) brassy-green, overlying black; a pale spot, as in fore-wing, at cell-end, one against costa in 7, a pair (touching) in 4 and 5, and indications of a smaller similar spot in 6; veins coloured as on fore-wing and showing up clearly; margin broadly French grey with an ochreous tinge, the latter tinge mainly due to a faintly indicated double sub-marginal row of spots as on fore-wing; marginal line as on fore-wing. Eyes hairy.

♀. Upper-side, both wings blackish-brown, rather dark, with some basal bright blue scaling (especially on fore-wing); marginal line and cilia as in ♂. Fore-wing with minute pale-ringed spot at cell-end; faintly paler sub-marginally as in ♂. Hind-wing with cell spot and discal series of under-side visible above by transparency; margin narrowly grey-blue, especially between anal angle and vein 4, where, in consequence, sub-marginal dark spots are visible in areas 2 and 3 in particular. Under-side as in ♂ but with the following differences: Fore-wing: ground colour decidedly browner; discal spots much more prominent and clearly black-centred; spot at cell-end smaller and less diffuse; inner row of sub-marginal spots distinctly orange tinted in areas 2 and 3, less so towards apex; tornal angle occupied by a large rhomboid pale grey spot; veins not so prominent. Hind-wing: rather more brassy-green; discal series of rounded white spots complete, although some of the spots are rather faint; spots of inner sub-marginal series entirely orange, inwardly tipped with pale grey; outer series lighter than in ♂; veins more prominent than in ♂.

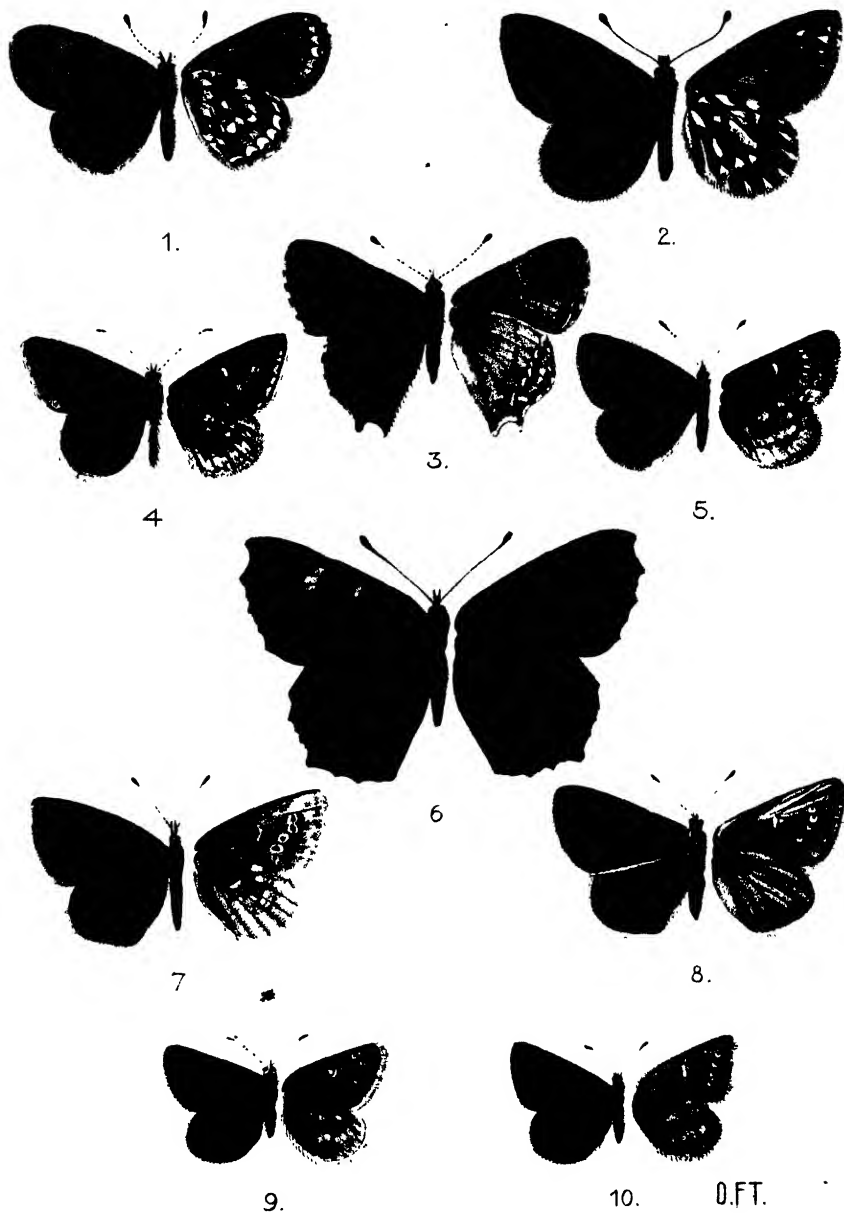
Length of fore-wing, ♂ 15 mm., ♀ 14 mm.

Described from ♂ Holotype from Milam, 11,000 ft., 6. vii. 24; and ♀ Allotype from Burfu, 11,500 ft., 29. 6. 24; collected by H. G. Champion, and now in British Museum. In addition, twenty ♂♂ and ♀♀ were obtained at the same localities.

It is not without considerable hesitation that these two specimens are described as a new species. They approach most nearly in their superficial characters the Himalayan forms known as *stoliczkana* Feld. and *drasula* Swinhoe, treated by Col. Evans (J.B.N.H.S. xxx, p. 349, 1925) as races of *Polyommatus eros*, but



RHOPALOCERA TAKEN ON THE KUMAON
TIBET BORDER IN 1924.



RHOPALOCERA TAKEN ON THE KUMAON
TIBET BORDER IN 1924.

for the green suffusion of the under sides of the hind wings. The ascertainment of their real systematic position, however, in view of our ignorance of these Himalayan forms, would entail so much labour that it seems best so to describe them rather than as a race of some other poorly-known species.

The other *Polyommatus*, figured on Pl. ii, fig. 8, can only be regarded as an extreme development of the form referred to by Evans (l.c.) as *P. eros ariana* Moore.

EXPLANATION OF PLATES II AND III.

II. Fig. 1. *Mesapia peloria* Hew., ♂, Girthi Valley, N. Kumaon, 13,000 ft. 2. *Baltia butleri* Moore, ♂, Chojan, N. Kumaon, 15,500 ft. 3. *Parnassius delphi*us Eversmann, sub-sp. *kumaonensis* nov., ♂, Shillung, N. Kumaon, 12,500 ft. 4. *Colias ladakensis* Feld. f. *flava* nov., ♂, Laptel, N. Kumaon, 14,000 ft. 5. *C. ladakensis* Feld. (f. typ.), ♂, Laptel, 14,000 ft. 6. *Parnassius simo simo* Gray, ♂, Chaldy, Tibet Border, 16,000 ft. 7. *Colias eogene* Feld., ♂, Sangcha, N. Kumaon, 14,500 ft. 8. *C. eogene* Feld., ♀, Kyungar, N. Kumaon, 14,000 ft.

III. Fig. 1. *Melitaea arcesia sindura* Moore, ♀, Chaldy, Tibet, 16,000 ft. 2. *Argynnis eugenia rhea* Gr.-Gr., ♂, Shaga, Tibet, 16,000 ft. 3. *Heliophorus androcles coruscans* Moore, ♂, Gori Gorge, N. Kumaon, 12,000 ft. 4. *Polyommatus dux* sp. n., ♂, Milam, N. Kumaon, 11,000 ft. 5. *P. dux* ♀, Burfu, N. Kumaon, 11,500 ft. ; 6. *Vanessa urticae rizana* Moore, ♂, Milam, N. Kumaon, 11,000 ft. 7. *Lycaena galathea* Blanch., ♀, Milam, N. Kumaon, 11,000 ft. 8. *Polyommatus ariana* Moore, ab., ♂, Laptel, N. Kumaon, 14,500 ft. 9. *Lycaena pheretes lehana* Moore, ♂, Girthi Valley, N. Kumaon, 14,500 ft. 10. *L. pheretes lehana* Moore, ♀, Girthi Valley, 13,000 ft.

ON SOME NEW BRITISH THYSANOPTERA.

BY RICHARD S. BAGNALL, F.R.S.E., F.L.S.

In the following records *Aeolothrips tenuicornis* sp. n., *Limo-thrips schmutzi* Pr., *Sericothrips bicornis* K., *Frankliniella anglicana* sp. n., *Oxythrips virginalis* Pr., *O. quercicola* sp. n., *O. pernicious* sp. n., *Haplothrips subtilissimus* var. *atricornis* Pr., *Cryptothrips icarus* Uzel, *Trichothrips amabilis* sp. n. and *T. britteni* sp. n. are recorded as British for the first time, whilst a number of other species, including several of the genus *Thrips*, remain to be described or recorded later. It will be noted that the most of them are from the Southern Counties, and it may be taken for granted that opportunities of collecting in Devon, Cornwall and the South-West should further add to our knowledge of the group.

SUB-ORDER TEREBRANTIA.

Superfamily AEOLOTHRIPOIDEA.

Family AEOLOTHRIPIDAE (Hal.) Bagn.

Aeolothrips fasciatus L., var. *propinquus* Bagn.

When I described *Aeolothrips propinquus* (Ent. Mo. Mag., 1924, lx, p. 269) I had before me a large series of a noticeably larger species which I then regarded as the true *fasciatus*. Upon obtaining my collection from storage, however, I found that all my *fasciatus* from the British Isles, Europe, North Africa, North America and the Canary Islands agreed with *propinquus* in size and general details, and differed essentially from the larger form which I had regarded as *fasciatus*. Whilst *propinquus* should in our present state of knowledge be referred to *fasciatus*, the name may be retained as a variety thereof, the form differing in the very minute setae of the costa and upper vein in the fore-wings as compared with other examples in my possession. It is obvious, therefore, that the larger examples with the long antennae are the ones to be differentiated from *fasciatus*, and I now describe them.

Aeolothrips tenuicornis sp. n.

♀. Length 1.8–2.0 mm.

Near to *Aeolothrips fasciatus* but noticeably larger and stouter, and with longer and more slender antennae. The head is transverse with cheeks rounded and is as long as or but slightly shorter than the pronotum. In the type specimens the antennae are about 3.0 times as long as the head with joints 3 and 4 noticeably longer and more slender than in *fasciatus*, 3 being about 5 times as long as broad (as compared with 3.5 times as long in *fasciatus*) and only 1.2 times as long as 4 which is similarly much longer compared to its breadth than in *fasciatus*; the 5th joint is about 0.8 as long as 4 and 1.35–1.4 times as long as 6–9 together.

SURREY, Woldingham, Warlingham, Caterham and Purley Oaks, not uncommon in flowers of *Verbascum nigrum*, July, 1924. I have also found it on the Continent on *Verbascum* spp.

Rhipidothrips graciosus Uzel.

BERKSHIRE, Besselsleigh, on oats, July 1914; SURREY, Box Hill, Warlingham and Leith Hill, on grass, July 1925.

Family MELANOTHRIPIDAE Bagn.

Melanothrips angusticeps Bagn.

The food-plant of this very local species is *Helianthemum Chamaecistus*; the perfect insect appears in the flower in June, but I have not yet seen the larvae. The following is only the second record:—

SURREY, in a lane near Warlingham, numerous ♀♀, June 1925; numerous ♀♀ and a few ♂♂, June 19th, 1926.

Superfamily *THRIPOIDEA*.Family *THRIPIDAE* Uzel.*Limothrips schmutzi* Pr.

1920, Priesner; *Entom. Zeitschr.*, xxxiii, No. 9.

♀. This species differs from *L. cerealium* in having the third antennal joint symmetrical and the ninth abdominal segment furnished with a pair of long, strong spines as in *L. denticornis* and *L. angulicornis* (see table, Bagnall, 1924, *Ent. Mo. Mag.*, lx, p. 270). We can now claim the four known species as British.

SURREY, Leith Hill, one ♀ on grass with *L. denticornis* and *Aptinothrips refus*, May 2nd, 1926; and also on Box Hill. Previously known from Austria.

Sericothrips bicornis (Karny).

Williams (*Ent.*, xlix, pp. 222-227) has already demonstrated that the *S. staphylinus* of Uzel and other Continental authors is not the same as our *Ulex*-species, in consequence of which the Continental form must bear the trivial name of *bicornis*—a name given to it by Karny in error! The following are the first British records:—

SCOTLAND, Banchory, Deeside, one ♂ on *Lotus*, whilst collecting with Mr. G. D. Morison, June 1924; ENGLAND, Surrey, Box Hill, one ♀, by general sweeping, May 1926.

Sericothrips gracilicornis Williams.

SURREY, common on *Vicia* sp.; Box Hill and near Purley, June 1924.

Frankliniella anglicana sp. n.

This species comes into Hood's Section III or '*intonsa*' group and into a sub-section differing from *intonsa* in that the head is not convergent posteriorly and the post-ocular setae are well-developed.

Length 1.1 mm.

Colour dark brown to dark grey-brown with the head of a richer shade; fore-tibiae and all tarsi very slightly lighter. Antennae with joint 2 darkest of all, 1 and 5-8 grey-brown and 3 and 4 also grey-brown but somewhat lighter; 3, 4 and 5 inclined to be paler basally. Fore-wings uniformly tinged with a pale greyish-yellow.

Head transverse, about 0.7 as long as broad. Relative lengths (and breadths) of antennal joints 3-8 approximately as follows:—46(22): 42(21): 35(17): 49(17): 8:16μ. Joints 3 and 4 constricted distally to seat trichome.

Setae or fore-wing somewhat long, those on costa as long as to longer than the median breadth of wing; costa, upper-vein and lower-vein with 20, 3+14 and 13 seta respectively.

Abdomen with posterior margin of tergite 8 apparently without a 'comb.'

Interocellar seta 40μ long separated by 12-13μ and set between the posterior ocelli.

Length of postocular setae	...	...	...	34 μ
„ „ antero-angular pronotal setae	...	...	...	65 „
„ „ inner anterior pronotal setae	...	...	...	49 „
„ „ postero-angular pronotal setae	...	...	...	65 „
„ „ inner posterior pronotal setae	...	...	...	71 „
„ „ apical abdominal setae	...	...	...	120 „

BERKSHIRE, Besselsleigh, one ♀ on pine, 13. vi. 1914. I have submitted the unique example to Priesner, to whom it is unknown.

Oxythrips virginalis Pr.

1920, Priesner, Sitz. Akad. Wiss. Wien, Math.-Naturw. Klasse, Abt. 1, 129, p. 72.

I have discovered three examples of an *Oxythrips* in a tube of *Anaphothrips obscurus* collected many years ago, which agree very closely indeed with Priesner's description except in the coloration of the antennae, which in two of my specimens is as follows: joint 1 pale, practically colourless, 2 yellowish-brown, 3 lightly shaded with light grey-brown, 4 more deeply shaded, especially distally, and 5-8 of a uniform dark brown. My examples would also appear to be a trifle larger—about 1.0 mm. long as compared with 0.8-0.9 mm.

BERKSHIRE, Besselsleigh, three ♀ ♀ on grass, 13. vi. 1914. Previously known from Austria only.

Oxythrips quercicola sp. n.

♀. Length about 1.0 mm.

Yellow shaded with grey to grey-brown which is inclined to form several transverse darker bars across the abdomen. Wings uniformly pale greyish-yellow; eyes black, ocelli with orange-red hypodermal pigmentation. Antenna with joint 1 colourless, 2 yellowish, 3 yellowish-brown, 4 and 5 brown but not quite so dark as 6-8, which are of a deep blackish-brown. Apical abdominal bristles grey-brown much as in *O. virginalis*.

Head noticeably transverse, 0.6-0.65 as long as broad (namely $94 \times 154 \mu$); antennae 2.5 times as long as the head, much as in *O. virginalis*, with the lengths and breadths of joints 3-8 approximately as follows:—41(19): 38(19): 32(18): 47(19): 8: 15 μ .

Pronotum transverse, longer than head and about 0.65 as long as broad, bristle at each hind angle curved, greyish and about 0.36 the length of the pronotum.

Fore-wing with 29 costal setae, upper vein with 4+3 basally and 3, widely spaced (1+1+1), in the distal half, and lower vein with 11 setae; wing-setae dark, much stronger than in *virginalis* which has only 8 setae in the lower vein.

This species may be readily distinguished from *virginalis* by its shorter, transverse head and the chaetotaxy of the wings.

SCOTLAND, Berwickshire, Cockburnspath, three ♀ ♀, from flowers of *Quercus robur*, June 1924. I could have obtained more examples but for a torrential rainstorm.

Oxythrips pernicio sp. n.

This comes nearest to *O. ajugae* amongst European species, from which it differs in the structure of the intermediate antennal joints, in which it approaches the only American species, *O. divisus* Hood.

♂. Length about 0.8 mm.

Length (and breadth) of head and pronotum 86(100) and 90(110) μ respectively, as compared with 102(124) and 99(120) in *O. divisus* ♂.

Third antennal joint much broader at base than the greatest breadth of stem which is shaped as in *O. divisus*; sixth segment not divided. The relative lengths (and breadths) of segments 3-8 in the ♂ of the three species are approximately as follows:—

O. pernicio sp. n. 32(19) : 30(18) : 27(17) : 37(18) : 7 : 14.

O. divisus Hood. 41(21) : 36(21) : 29(18) : 38(20) : 7 : 12.

O. ajugae Uzel. 38(19) : 35(18) : 31(17) : 41(18) : 8 : 14.

SURREY, Leith Hill, one ♂ on *Salix*, 2. v. 1926.

Sub Order TUBULIFERA.

Family PHLOETHRIPIDAE.

Haplothrips subtilissimus (Hal.) var. *atricornis* Priesner.

This *Haplothrips* is apparently attached to *Larix*, the typical form being most usually met with on *Quercus* spp. I am shortly describing an allied species that is common on *Pinus* in the Eastern Pyrenees.

NORTHUMBERLAND, Corbridge, one ♂ on *Larix*, August 1919 (*teste* Priesner).

Cryptothrips icarus Uzel.

An interesting addition to the British fauna.

HAMPSHIRE, Hengistbury Head on *Carex vulpina* with *C. dentipes*, September 1924.

Trichothrips propinquus Bagn.

This species is to be found under *Corticium* growing on trees, and is now known from England, Scotland and Austria.

SURREY, near Headley, Box Hill and Gomshall; DEVONSHIRE, Torquay, October 1918; OXFORDSHIRE, Wytham, Cothill, June 1912.

Trichothrips amabilis sp. n.

Belonging to the *T. caespitis*—*semicaecus* group.

♀. Length 1.8-1.9 mm.

Head transverse, broader than long, and of a uniform dark brown colour, eyes well-formed. Antennae with joint 1 brown, not as dark as the head, 2 also brown, lighter than 1, 3 yellow, shaded to a light grey-brown in the distal half, 4-8, except the short stem of 4 which is yellowish, of a dense blackish-brown much darker than the head. Post-ocular bristles yellow, well-developed.

Pronotum shorter than head, transverse, brown but mottled with reddish hypodermal pigmentation. Pterothorax quadrate, fore-margin and sides concolorous with head, medianly yellowish to greyish-brown.

Abdomen, except the distal three-fourths of tube or thereabouts (which is dark brown), yellowish shaded irregularly with light grey to grey-brown. All femora grey-brown, lighter than head; tibiae and tarsi yellow, the former but very slightly shaded with grey. Fore-tarsus armed with a sharp tooth. Wings light yellowish-grey; fore-wings with 9-10 duplicated cilia. Terminal hairs fumate, as long or practically as long as tube.

The form of the antenna is distinctive, the general shape of the joints much as in *T. buffae* Hood. Joint 3 is small, obconical and scarcely longer or broader than 2 whilst 4 is noticeably the largest joint of all. A condition exists that does not appear to have been described although it is present in the winged form of *T. semicaecus* and would appear to be correlated with flight; it takes the form of a number of conical auxiliary sense-cones more or less closely clustered on the under-side of the distal three-fifths of each of the joints 4 and 5, but more numerous on the former.

Length (and breadth) of head, eye, pronotum and pterothorax 216(230), 95(60), 162(350) and 418(445) μ respectively. Breadth of abdomen 486, length of tube 190, and breadth at base and apex 85 and 40 μ respectively. Relative lengths (and breadths) of antennal joints 38(41), 63(37), 65(40), 81(46), 68(38), 61(32), 58(27) and 43(17) μ , the last two joints closely united. Length (and breadth) of fore-femur and fore-tibia 210 and 105 μ respectively.

A much larger species than either *caespitis* Uz. or *longisetis* Bagn. and differing both in colour and points of structure; it perhaps more closely approaches *semicaecus* Uz., from which it may be separated by its dark head, large eyes and the structure of the antennae, more especially the small third and massive fourth joints.

SURREY, one ♀ near Gomshall, by beating a stack of old discarded fencing composed of hazel, alder and cherry, September 5th, 1926, with *T. ulmi* (Hal.) and a solitary *T. propinquus*.

Trichothrips britteni sp. n.

♀. *Forma aptera*. This species comes close to *corticis* (DeG.)=*copiosus* Uzel, from which it differs in the coloration of the head, antennae, femora and tube, the last-named being also much stouter compared to the length than in *corticis*, apparently of a coriaceous texture and sharply constricted at apex. The body is coloured much as in *corticis*, but with the head yellow to light yellowish-brown, and the abdomen distally yellowish and the tube reddish-yellow as in *T. propinquus* Bagn. Fore-coxae brown, all legs yellow with the intermediate and hind femora scarcely darker than the tibiae. Antenna with joint 1 light grey-brown, 2, 3 and 4 yellow, with 4 lightly shaded with grey distally; 5 yellowish, shading to grey distally, 6 light grey-brown except in the basal third or thereabouts, and 7 and 8 (except the short stem of 7) grey-brown. Post-ocular, pronotal and abdominal bristles pale, much as in *corticis*.

Fore-legs stout, the femora elongated and practically twice as long as the tibia. Abdomen with the apical hairs only a little shorter than the tube.

Length (and breadth) of head, pronotum and pterothorax 256(212), 270(405)

and 270(470) μ respectively. Breadth of abdomen 675 μ , length of tube 256 and breadth at base and apex 121 and 49 μ respectively.

Length (and breadth) of fore-femur and fore-tibia 300(121) and 160(60) μ respectively. Relative lengths (and breadths) of antennal joints approximately 51(43), 68(39), 86(41), 81(40), 70(38), 65(37), 58(30) and 51(19) μ , the terminal joint being constricted at base.

OXFORDSHIRE, Shotover, near Oxford, several ♀ ♀ on dead oak stump, 4, iii, 1916 (*H. Britten*). I find pleasure in naming the species after its discoverer.

Edinburgh,

September 27th, 1926.

Periodicals, etc., received.

(Continued from p. 144.)

British Museum (Natural History).

'Guide to the Exhibited series of Insects in the Department of Entomology (Fourth Edition), pp. 66, with 62 illustrations, 1926. Price 1/-.

Proceedings of the South London Entomological and Natural History Society, 1925-26, pp. xviii and 112, with 9 plates.

This Annual Volume of the Proceedings includes, in addition to the usual Reports, the Annual Address ['Variation'] by T. H. L. Grosvenor, and the following papers on entomological subjects: (1) 'Insect Orders,' by W. J. Lucas; (2) 'Melanism in the Lepidoptera,' by R. Adkin; (3) 'Corsica or the Isle of Rest' [butterflies, etc., observed], by O. R. Goodman; (4) 'Lepidoptera at sugar,' Eastbourne, by R. Adkin; (5) 'Entomology in Trinidad,' by F. W. Ulrich.

The North Western Naturalist, Vol. I, No. 2, June 1926.

Contains one entomological article, entitled 'Notes on Craneflies from Merioneth,' by C. H. W. Pugh.

South Western Naturalists' Union, Annual Report and Proceedings to June 1925.

Includes an Address by Mr. C. W. Bracken to the Zoological Section at the Plymouth Conference, 1925, entitled 'The Hemiptera-Homoptera (Cicadae) of Devonshire.'

South Eastern Union of Scientific Societies. Congress at Colchester, 1926. Essex Survey, edited by G. E. Hutchings: pp. 133, with map and plates: Colchester, 1926.

Contains one paper on insects, entitled 'The Entomology of Essex,' pp. 76-97, with 4 plates (illustrating larvae, pupae, or imagines of *Plusia moneta*, *Adopaea lineola*, *Phorodesma smaragdaria*, *Aleucis pictaria*, *Lithacodia venustula*, and *Cucullia asteris*), by C. Nicholson. The chapter on Coleoptera, pp. 84-85, includes notes on a few of the more important forms occurring in the county; but no mention is made of several interesting beetles (some of which are well-known New Forest insects) recorded from Hainault or Epping, e.g. *Pediacus dermestoides*, *Laemophloeus bimaculatus*, *Cicones*, *Batrissus venustus*, *Acrognathus*, *Phloeotrya*, *Leptura scutellata*, etc. Instead we have a list of introduced or 'troublesome' species, and a statement that a small Hydrophilid, *Paracymus aeneus*, is the most noteworthy Essex beetle. The actual number of Coleoptera recorded for the county is given as about 1,800. The Lepidoptera are dealt with on pp. 87-89.

The Entomologist, Vol. LIX, April 1926. Reprint of pp. 97-99.

This Reprint contains a portrait and obituary notice of William Bateson, by W. J. Lucas. Our own notice appeared in the March number of this Magazine, pp. 64, 65.

Annals of Tropical Medicine and Parasitology, Vol. XX, No. 3, August 1926.

This number contains two papers on entomological subjects: (1) 'A New Larva of *Oestrus* (*Gastrophilus*) from Zebras,' by A. W. N. Pillers and A. M. Evans; (2) 'The Mosquito Infectivity of *Plasmodium vivax* after prolonged sojourn in the Human host,' by W. Yorke and W. R. Wright.

The Natural History of Wicken Fen, edited by Prof. J. S. Gardiner, F.R.S.: Part III, April 1926.

The following papers on entomology are included:

15. 'Memories of Wicken,' by W. Farren.

16. 'The Aquatic Coleoptera of the Wicken Fen Area,' by F. Balfour Browne. 129 species were observed by the author during 1913-18, as against 154 known to him from the County of Cambridgeshire.

20. 'Thysanura,' by Miss G. E. Pickford.

21. 'Hemiptera-Heteroptera,' Part I. Hydrobiotica (Veliidae-Notonectidae) and Sandaliorrhyncha (Corixidae), by G. E. Hutchinson.

22. 'Hymenoptera Aculeata,' by E. B. Nevinson.

24. 'A List of Lepidoptera of Wicken and the Neighbouring Fens' (Arc-tiadae-Micropterygidae), by W. Farren.

Supplementa Entomologica, No. 12, 15 März, 1926.

W. Horn. Ueber den Verbleib der entomologischen Sammlungen der Weit (ein Beitrag zur Geschichte der Entomo-Museologie), pp. 1-133, with a portrait of Louis Bedel (born in Nantes, 16.v.1849, died in Paris, 26.i.1922).

The author, in his list of the more important entomological collections (especially those containing 'types') at one time or still in the hands of private individuals, has got together by means of a card-catalogue, started in 1910 and kept duly posted, at the 'Deutsch. Entomolog. Museum, at Dahlem, Berlin, a vast amount of information as to where these collections are now to be found, whether in public or private museums or elsewhere. Under the original possessors' names quoted, particulars are given as to the groups of insects owned at one time by them, and into whose hands they passed, if sold by auction or dispersed in other ways. Some 46 collections, including 26 quoted by Fabricius in his various writings, have not yet been traced by Dr. Horn, who would be glad of information concerning them. One of these (that of Lee of Hammer-smith), as stated long ago by Westwood, is in the Hope Dept. of the Oxford Museum. The name of a late member of the British Museum staff, C. O. Waterhouse, has been omitted, and that of one of his brothers, F.W., has been confused with an Australian writer.

U.S. Department of Agriculture, 1926. Department Bulletins:

No. 1363. 'Host relations of *Compsilura cinnamomata* Meigen, an important parasite of the gipsy moth and the brown-tail moth,' by R. T. Webber and J. V. Schaffner, Jr.

No. 1369. 'Studies of the Pink bollworm (*Pectinophora gossypiella* Saunders) in Mexico,' by W. Ohlendorf.

No. 1369. 'The Cattle grubs or Ox warbles (*Hypoderma lineatum* de Villers and *H. bovis* de Geer), their biologies and suggestions for control,' by F. C. Bishopp and others.

Farmers' Bulletins:

No. 1461. 'The common Cabbage worm (*Pieris rapae* L.) and its control,' by F. H. Chittenden.

No. 1462. 'The potato leaf hopper (*Empoasca mali* Le B.) and how to control it,' by J. E. Dudley, Jr.

No. 1472. 'Preventing damage by Termites or white ants,' by T. E. Snyder.

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Journal of Agricultural Research, Vol. XXXII, Nos. 3, 7, 9-12, Feb., April, May, June, 1926. Reprints.

No. 3. 'Platygaster hiemalis Forbes, a parasite of the Hessian fly,' by C. C. Hill.

No. 7. 'Observations on a recurring outbreak of *Heterocampa guttivitta* Walker and natural enemies controlling it,' by C. W. Collins.

No. 9. 'The Pea Aphid (*Illinoia pisi* Kalt.) in California,' by R. E. Campbell.

No. 10. 'A Physiological Study of the growth of the Mediterranean Flour moth (*Ephesia kuehniella* Zeller) in wheat flour,' by C. H. Richardson.

No. 11. 'A Two-year study of the development of the European Corn borer [moth] in the New England Area,' by G. M. Barber.

We are not told in this paper the Order of insects to which the corn-borer belongs.

No. 12. 'Observations on *Cirphis latiuscula* H. Sch. in the Gulf Coast region of Texas,' by R. A. Vickery.

Hübner's 'Tentamen' (1806).—I have read with much misgiving Dr. Stiles' suggestion for the suspension of the International Rules in order to establish the nomenclatorial validity of this publication. I am definitely a supporter of its validity, but I am so because I am convinced that it is in accord with the rules of the Code. It will, I hope, soon be discussed by our British Committee on Nomenclature, and then I hope it will stand on its evidence; if it falls, it falls, and I shall regret it, but most certainly I shall not ask for the suspension of rules to admit it. I hold that the suspension of rules, which means the abrogation of a law so as to let a wrong doer off his penalty, is absolutely bad and ought never to be permitted. Dr. Stiles asks for opinions on the question and therefore I write and trust that the 'Suspension of Rules' will not be allowed.—G. T. BETTUNE-BAKER, 20 Newbold Terrace, Leamington Spa : October 20th, 1926.

Coleoptera on burnt areas in S. Devon and a note on Strangalia aurulenta.

—On or near burnt areas in the Newton Abbot to Bovey Tracey district I have this year observed the presence of the three beetles, *Melanophila acuminata*, *Criocephalus fesus* and *Asemum striatum*. The work of the larvae of *Asemum* has been conspicuous for a good many years, but the beetle itself had not previously been seen by me at large. It is quite likely that the other two followed the very extensive fires that raged in the heath country in the dry year of 1921, but in any case their occurrence so far west may be of interest.

In the middle of July and first part of August I made a special attempt to find *Strangalia aurulenta* at Bovey Tracey, the locality from which I had sent it to Dr. Sharp years ago, though until the present year I have not since noticed it. A single specimen, however, was taken close to the original spot by the late Charles Rothschild some years later, when I directed him to it. By very hard work I was able this year to get a few specimens, the first on July 14th, the last in the middle of August, when it was evidently over, and the earlier date was no doubt too late for the first specimens. So far as my experience went the beetle was only active on the hottest days between the hours of noon and 4 p.m. (summer time), when it may be taken on the wing, and at a short distance rather resembles a Burnet-moth in flight. It settles very low down on the trunks or surface roots of trees, but apparently leaves these entirely except in bright hot weather. I have seen it crawl up from thick herbage covering the ground in the open, so that, like many active foreign Longicorns with which I am acquainted, it is possible that it is rarely or never found on trees unless the weather is altogether favourable. Although *Umbelliferae* were in particularly fine condition, I saw none on these flowers nor on any others, though careful search was made on account of the recorded captures of other collectors. Whether the past season was a good one for the species is, of course, uncertain, but I am sure that one would have many blank days even with the most favourable weather, though giving one's entire attention to this beetle. Of the usually common *S. armata*, which often occurs freely on the same spot, I saw but two examples during the period mentioned. On the other hand a month or more previously *Pachytia octomaculata* was swarming, as is usual in the district.

S. aurulenta is no doubt well distributed in S. Devon, for last year Mr. W. E. H. Hodson recorded* it from Kingsteignton and Bere Ferrers, and some years ago I saw what I have no doubt was the same species on the wing near Churston Ferrers. There is much difference between some of these localities.—R. C. L. PERKINS, Newton Abbot: October 25th, 1926.

Platychirus tarsalis Schumm. in Cambridgeshire.—The capture of this species in some numbers in Woodditton Wood (Cambs.) on May 22nd and 23rd of this year is, perhaps, worthy of record. It was first known as British from specimens caught in 1894 by Mr. R. C. Bradley near Painswick in Gloucestershire. In 1922 Col. Jermyn found it in the woods near Weston-super-Mare in Somerset, and in 1924 Mr. J. Davis Ward recorded it from Grange-over-Sands in Lancashire (*vide* Ent. Mo. Mag., 1924, p. 88). It is known to occur in Denmark and Central Europe down into Styria and Moravia, but is always considered to be an uncommon insect. In Woodditton Wood it was flying low over the herbage in the drives and settling upon the flowers of *Geum rivale*, a plant which grows in profusion in this particular locality.—J. E. COLLIN, Newmarket: November 1924.

* Trans. and Proc. Torquay Nat. Hist. Soc., IV. p. 28.

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I. A. R. I. 75.

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